EXHIBIT A

UNCLASSIFIED

EXHIBIT 10

In the United States Patent and Trademark Office

Serial Nr.: 06/859,033

Filed: 04/25/1986

Inventor(s): ALTON B. HORNBACK

Title: REAL TIME BORESIGHT ERROR SLOPE SENSOR

Examiner and G.A.U.: CHARLES T. JORDAN/GAU 221

Amendment A

CLASSIFIED ANNEX

Date: 1 May 1987

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

RECEIVED
GROUP 220

MAY

LICENSING & REVIEW

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

Agency and office or origin:
Air Force Armament Laboratory/DLM (AD)
Eglin AFB FL 32542

Contract No. IRAD 111182	☐ Review For Declassification	☐ Declassify On 15 OCT 99	
Classified by AFAL/DLM (AD) EGLIN AFB		☐ Downgrade To	On

-AA2-

CLASSIFIED ANNEX

Date: [illegible] 87

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

RECEIVED
GROUP 220

LICENSING & [illegible]

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

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Contract No.	IRAD 111182	☐ Review For Declassification	☐ Declassify On 15 OCT 99
Classified by	AFAL/DLM (AD) EGLIN AFB	☐ Downgrade To	On

-A42a-

UNCLASSIFIED

(U) Claims:

(U) Claim 1, cancel and rewrite as new claim 3 as follows:

(C) 3. A boresight error slope reduction system for sensing, in real time, a boresight error slope in a homing seeker, said system comprising:

(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a wide bandwidth video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said signal voltage to steer said field-of-view so that said object remains within said field-of-view and a means for generating a low-pass filtered dynamic lag voltage from said video signal voltage, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a wide bandwidth video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said signal voltage to steer said field-of-view so that said object remains within said field-of-view and a means for generating a low-pass filtered dynamic lag voltage from said video signal voltage, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (e) a means for using said dither voltage to cause a dither of said boresight axis and

(U) (f) a means for causing said tracking loop to be open during said dither of said boresight axis and

(U) (g) a boresight error slope computer circuit for generating a transfer characteristic having a measurable curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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transf[illegible]racteristic having a mea[illegible]le curvature, said transfe[illegible]aracteristic being a voltage[illegible]unctionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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(U) (a) a transfer characteristic sample-and-hold circuit for obtaining two samples of said transfer characteristic, a first sample being obtained at a first instant, said first instant being the instant of coincidence between said wide bandwidth video signal voltage and said low-pass filtered dynamic lag voltage, and a second sample being obtained at a second instant, said second instant being at a different time from said first instant, and

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

a seco[illegible]stant, said second instant [illegible]ng at a different time fr[illegible]aid first instant, and

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

U N C L A S S I F I E D

(U) (f) a means for applying said automatic gain control voltage to said automatic gain control amplifier.

(U) Please add two new claims as follows:

(U) 5. The boresight error slope reduction system of claim 3 wherein said seeker is a radio frequency seeker having a phase sensing monopulse antenna and said additive means is a phase shifter.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

monopulse ... na and said additive means ... phase shifter.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

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EXHIBIT B

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EXHIBIT 11

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In the United States Patent and Trademark Office

EXHIBIT 11

Serial Nr.: 06/859,033

Filed: 04/25/1986

Inventor(s): ALTON B. HORNBACK

Title: REAL TIME BORESIGHT ERROR SLOPE SENSOR (u)

Examiner and G.A.U.: CHARLES T. JORDAN/GAU 221

RECEIVED MAY 11 1987 GROUP 220 LICENSING & REVIE

SUPPLEMENTAL **Amendment** A

CLASSIFIED ANNEX

Date: 6 MAY 1987

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

Alton B. Hornback
ALTON B. HORNBACK, APPLICANT

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

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Contract No. IRAD 111182	☐ Review For Declassification	☐ Declassify On 15 OCT 99	
Classified by AFAL/DLM (AD) EGLIN AFB	☐ Downgrade To	On	

-A47-

CLASSIFIED ANNEX
Date: 6 ... 987

MAY

GROUP 220
LICENSING & REVIEW

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

Alton B. Hornback
ALTON B. HORNBACK, APPLICANT

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

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Classified by AFAL/DLM (AD) EGLIN AFB	☐ Downgrade To	On	

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(U) Claims:

(U) Claim 1, cancel and rewrite as new claim 3 as follows:

(C) 3. A boresight error slope reduction system for sensing, in real time, a boresight error slope in a homing seeker, said system comprising:

(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker thereby causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said video signal voltage to generate a filtered dynammc lag voltage, said dynamic lag voltage being used to steer said field-of-view so that said object remains within said field-of-view, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (a) a [illegible]er having a steerable fiel[illegible]-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker thereby causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said video signal voltage to generate a filtered dynammc lag voltage, said dynamic lag voltage being used to steer said field-of-view so that said object remains within said field-of-view, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (e) a means for using said dither voltage to cause a dither of said boresight axis and

(U) (f) a means for causing said tracking loop to be open during said dither of said boresight axis and

(U) (g) a boresight error slope computer circuit for generating a transfer characteristic having a measurable curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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tran[illegible]haracteristic having a me[illegible]ble curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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(U) (a) a transfer characteristic sample-and-hold circuit for obtaining two samples of said transfer characteristic, a first sample being obtained at a first instant, said first instant being the instant of coincidence between said video signal voltage and said filtered dynamic lag voltage, and a second sample being obtained at a second instant, said second instant being at a different time from said first instant, and

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

secon[redacted]nt being at a different [redacted]from said first instant, [redacted]nd

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

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(U) (f) a means for applying said automatic gain control voltage to said automatic gain control amplifier.

(U) Please add two new claims as follows:

(U) 5. The boresight error slope reduction system of claim 3 wherein said seeker is a radio frequency seeker having a phase sensing monopulse antenna and said additive means is a phase shifter.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

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EXHIBIT C

#33

ALTON B. HORNBACK
5650 Bloch Street
San Diego, CA 92122
(858) 453-3334
25 May 2007

U.S. PATENT AND TRADEMARK OFFICE
Office of the Solicitor
P.O. Box 15667
Arlington, VA 22215

Subject: Petition to Reissue Patent No. 6,079,666, Pursuant to 35 U.S.C. 131, so that it Conforms to Allowed Patent Application No. 06/859,033.

Sir:

On 27 June 2000, Patent No. 6,079,666 (Enclosure 1) was issued, after having been withheld for 13 years as a result of its classification at the level of SECRET pursuant to national Security Executive Order 12356, and therefore, subject to a Secrecy Order pursuant to 35 U.S.C. 181. However, the specifications in that patent were so replete with errors (Enclosure 2) that the patent did not conform to the allowed specifications in the application (Enclosure 3). Moreover, the printed claims were not the allowed claims. (Enclosure 4).

On 7 July 2006, Petitioner filed Case No. 06-CV-1387 BEN AJB in U.S. District Court for a "PETITION FOR WRIT OF MANDAMUS" to order the PTO to issue a new patent which conforms to the allowed patent application. In its ORDER at 5-6 (Enclosure 5, excerpts), filed 15 May 2007, dismissing that case "without prejudice", the Court held:

> Contrary to Petitioner's assertion, he has not exhausted his administrative remedies. ... According to the PTO, Petitioner has not properly filed either a certificate of correction under 35 U.S.C. 254, 255 (sic), or a reissue under 35 U.S.C. 251 (sic) ... [citation omitted].
>
> Therefore, Respondent's Motion to Dismiss Petitioner's Complaint for Writ of Mandamus for lack of subject matter jurisdiction is granted without prejudice.

First, the nature and extent of those errors, particularly those in the "GLOSSARY" and in the patent claims, are such that a "Certificate of Correction" is manifestly inappropriate in form.

Second, 35 U.S.C. 251 does not apply to reissue of patent resulting from defects in the patent caused by the PTO. That statute states in part (emphasis added):

> Whenever any patent is, through error without any deceptive intention, deemed ... inoperative or invalid by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Director shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent ... , and in accordance with a new and amended application, for the unexpired term of the patent.

First, it would be absurd to hold the patentee liable for a fee to correct defects in the patent which were caused by the PTO.

Second, a new and amended application is totally unwarranted. Except for disallowed claims 1 and 2, the application is, verbatim, precisely that, as amended by Petitioner during patent prosecution, and allowed by the Patent Examiner.

Thus, where, as here, defects in the patent were caused by the PTO, 35 U.S.C. 131, not 35 U.S.C. 251, is the operative statute for reissuance so that the patent conforms to the allowed application. 35 U.S.C. 131 states, in toto (emphasis added):

> The Director shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor.

The operative words are "shall" and "therefor". Those two words mean that the Commissioner is required, by law, to issue a patent which conforms to the patent application. Patent No. 6,079,666 does not conform to the allowed Patent Application No. 06/859,033. Hence, the petition to reissue that patent so that it does.

Respectfully submitted.

Alton B. Hornback

Alton B. Hornback,
Applicant/Petitioner

Enclosures: 5. as noted.

EXHIBIT D

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

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OFFICE OF PETITIONS

Paper No. 34

ALTON B. HORNBACK
5650 BLOCH ST.
SAN DIEGO, CA 92122

In re Patent No. 6,079,666	:	LETTER RE PROPOSED
Issue Date: June 27, 2000	:	CERTIFICATE OF CORRECTION
Application No. 06/859,033	:	AND
Filed: April 25, 1986	:	INFORMATION TO CORRECT
Patentee: Alton B. Hornback	:	A PATENT

This letter is in response to a correspondence received May 29, 2007[1] to the U.S. Patent and Trademark Office (Office), which request the Office to "reissue"[2] U.S. Patent No. 6,079,666. The request alleges numerous errors in the printing of the specification of the patent, including purported errors in the specification and claims, referenced as Enclosures 2 and 4 in the May 29, 2007 letter. The purpose of this communication mailed pursuant to 35 U.S.C. § 254 and 37 CFR 1.322(a)(4), is to afford the patentee of the above-identified patent an opportunity to be heard on the matter discussed *infra* and to provide the patentee with information regarding corrections of patents.

A TIME LIMIT OF ONE MONTH FROM THIS MAILING IS SET FOR ANY REPLY TO THIS COMMUNICATION. NO EXTENSIONS OF TIME UNDER 37 CFR 1.136(a) OR (b) ARE AVAILABLE. IF NO REPLY IS RECEIVED WITHIN THE AFOREMETIONED TIME PERIOD, THE MATTER WILL BE DECIDED ON THE RECORD.

Statutes and Regulations

35 U.S.C. 154 Contents and term of patent; provisional rights.

(a) . . .
(4) SPECIFICATION AND DRAWING. —A copy of the specification and drawing shall be annexed to the patent and be a part of such patent.

35 U.S.C. 254 Certificate of correction of Patent and Trademark Office mistake.

Whenever a mistake in a patent, incurred through the fault of the Patent and Trademark Office, is clearly disclosed by the records of the Office, the Director may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A printed copy thereof shall be attached to each printed copy of the patent, and such

[1] The letter is dated May 25, 2007.
[2] The Office assumes the patentee is requesting a corrected patent when he asked the Office to "[r]eissue Patent No. 6,079,666, Pursuant to 35 U.S.C. 131[.]"

certificate shall be considered as part of the original patent. Every such patent, together with such certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Director may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

37 CFR 1.322 Certificate of correction of Office mistake.

(a)(1)The Director may issue a certificate of correction pursuant to 35 U.S.C. 254 to correct a mistake in a patent, incurred through the fault of the Office, which mistake is clearly disclosed in the records of the Office:

(i) At the request of the patentee or the patentee's assignee;

. . .

(4) The Office will not issue a certificate of correction under this section without first notifying the patentee (including any assignee of record) at the correspondence address of record as specified in § 1.33(a) and affording the patentee or an assignee an opportunity to be heard.

(b) If the nature of the mistake on the part of the Office is such that a certificate of correction is deemed inappropriate in form, the Director may issue a corrected patent in lieu thereof as a more appropriate form for certificate of correction, without expense to the patentee.

Intent to Issue a Certificate of Correction

As 35 U.S.C. § 254 and 37 CFR 1.322 set forth, the Director may issue a certificate of correction whenever a mistake in a patent, incurred through the fault of the Office, is clearly disclosed by the records of the Office. The patent, together with such certificate of correction (COC), shall have the same effect and operation in law as if the same had been originally issued in such corrected form. If the nature of the mistake on the part of the Office is such that a COC is deemed inappropriate in form, the Director may issue a corrected patent.

Upon review of the record, a certificate of correction, not a corrected patent, should be issued. The mistakes requested to be corrected found in Enclosure 2 are clerical or typographical in nature and are precisely the type of errors intended for a COC. Moreover, the errors found in Enclosure 2 are not gross or so numerous that a COC is deemed inappropriate in form. Thus, while the Director has the discretion to issue a corrected patent in lieu of a COC, the nature of the mistakes on the part of the Office with respect to the above-identified patent is such that a COC is deemed more appropriate. Additionally, a COC can be printed in a shorter amount of time than a corrected patent.

Both the patentee and the government have agreed that that the mistakes found in Enclosure 2 were errors. These changes also match with those found in Enclosure 3 of the May 29, 2007 letter. The Office also acknowledges such errors. The Office intends to correct many of these mistakes. However, some of these mistakes will not be corrected by the COC. With the exception of 35 U.S.C. § 154 requiring a copy of the specification be annexed to and be a part of the patent, there is no law or regulation with respect to how the patent will be printed. Thus, the Office was not required to print the specification of U.S. Patent No. 6,079,666 in any particular format. Granted, the Office attempted to present the specification of U.S. Patent No. 6,079,666, as written, including the same line spacing or formatting of the Glossary, but was under no obligation to print the specification exactly as presented by the applicant.

Therefore, pursuant to 37 CFR 1.322, the Office intends to issue the attached certificate of correction. The COC will not correct the following errors: (1) removing the paragraph breaks in column 3, line 60, column 4, lines 18 and 35, and column 6, line 43; (2) the line spacing at column 3, line 62, column 4, line 23, and column 5, line 34; or (3) the formatting errors relating to spacing and formatting in column 6, lines 27 through 67. Please review the Certificate of Correction. As stated above, if no reply is received, the matter will be decided on the record.

The USPTO regrets the error and the inconvenience.

Options to Correct Other Alleged Errors

Petitioner also alleges "the printed claims were not the allowed claims." As stated previously, the Director may issue a COC whenever a mistake in a patent, incurred through the fault of the Office, is clearly disclosed by the records of the Office. With respect to the alleged errors in the printed claims and as referenced in Enclosure 4, patentee has not shown to the satisfaction of the Director that the claims in the above-identified patent were mistakenly printed, were the fault of the Office, or are clearly disclosed in the Office's records.

Upon review of the record, there is insufficient evidence to show the claims printed in U.S. Patent No. 6,079,666 were an error or mistake incurred through the fault of the Office. First, while petitioner has provided the Office with Enclosure 4, he has not pointed out the purported errors in the printing of the claims, such as the column and line number in the printed patent where text should be corrected. Second, the papers included with Enclosure 4 do not appear to be part of the official record. For example, the UNCLASSIFIED stamp and the annotations D000322-D000326 in the lower right-hand corner do not appear in the Office's record. Thus, they are not evidence of the amendments submitted to the Office in May 1987. Third, the government has not agreed to that there were errors in the printed claims. Fourth, the Office appears to have two different copies of the Amendment A received May 4, 1987[3]. A first copy contains five pages having claims 3 through 6 and stamped "Licensing and Review DECLASSIFIED." This copy includes the substance of the claims printed in U.S. Patent No. 6,079,666. A second copy also appears to contain five pages having claims 3 through 6 but has claim language seemingly matching the contents of Enclosure 4. As such, the official record does not clearly indicate that the error in printing the claims of U.S. Patent No. 6,079,666 was entirely the fault of the Office and may indicate that the petitioner contributed to the purported error in printing the wrong claims in the patent.

For the above reasons, the requested corrections to the patent with respect to the claims will not be included in the attached certificate of correction and will not be treated at this time.

Nevertheless, if the patentee maintains that the error in printing the claims was the fault of the Office or if patentee wishes to request any other corrections, it is strongly advised that the text of the

[3] The amendment is dated May 1, 1987.

correction requested be submitted on a Certificate of Correction form, PTO/SB/44. A blank courtesy copy of PTO/SB/44 has been enclosed for your convenience. The location of the error in the printed patent should be identified on form PTO/SB/44 by column and line number or claim and line number. A request for a Certificate of Correction should be addressed to:

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In addition, please refer to the enclosed copies of §§ 1480, 1481 and 1485 of the Manual of Patent Examining Procedure (MPEP) for the preparation and submission of a request for a Certificate of Correction.

If the petitioner determines the error in printing the claims or other errors were the applicant's mistake, any such request should be in the form of a Certificate of Correction submitted under 37 CFR 1.323 and include a $100 processing fee. Direct such requests to the above address.

As an alternative, petitioner may also consider filing a reissue application. The provisions of 35 U.S.C. § 251 permit the reissue of a patent to correct an error in the patent made without any deceptive intention. In accordance with 35 U.S.C. § 251, the error upon which a reissue is based must be one which causes the patent to be "deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent." There must be at least one error in the patent to provide grounds for reissue of the patent. If there is no error in the patent, the patent will not be reissued. When the original application was filed before December 8, 2004, the basic filing fee for a reissue application is $790 (or $395 for small entity). Enclosed is MPEP 1402 for your consideration.

Employ Services of Attorney or Agent

An examination of this file reveals that patentee is unfamiliar with patent prosecution procedure. Lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Patentee is advised to secure the services of a registered patent attorney or agent to handle the above matters, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

A listing of registered patent attorneys and agents is available on the USPTO Internet web site http://www.uspto.gov in the Site Index under "Agents and Attorney Roster, Patent." Applicants may also obtain a list of registered patent attorneys and agents located in their area by writing to the Mail Stop OED, Director of the U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450.

Summary

Patentee is given ONE MONTH from the mailing of this letter to reply to this communication. In particular, the Office intends to issue a certificate of correction, as discussed in the above section, entitled, "Intent to Issue a Certificate of Correction," and as attached hereto. Also, as stated previously, if no reply is received within the time limit, the matter will be decided on the record.

Further correspondence with respect to this letter should be addressed as follows:

By Mail: Mail Stop PETITIONS
Commissioner for Patents
Post Office Box 1450
Alexandria, VA 22313-1450

The centralized location for hand-carried correspondence is the Customer Window located at:

Customer Service Window
Mail Stop Petitions
Randolph Building
401 Dulany Street
Alexandria, VA 22314

The centralized facsimile number is (571) 273-8300.

Telephone inquiries concerning this decision should be directed to Denise Pothier at (571) 272-4787.

Brian Hearn
Petitions Examiner
Office of Petitions

enc: completed Certificate of Correction (PTO/SB/44) for U.S. Patent No. 6,079,666
blank Certificate of Correction form (PTO/SB/44)
MPEP §§ 1402, 1480, 1481, 1485

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,079,666
APPLICATION NO.: 06/859,033
DATED : June 27, 2000
INVENTOR(S) : Alton B. Hornback

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the specification, column 2, line 2, "statistic" should read -- statistics --;

Column 3, line 7, "(e)" should read – (d) --;

Column 3, line 9, "(f)" should read – (e) --;

Column 4, line 12, cancel the text, "Re";

Column 4, line 14, "$\left[\frac{\Delta}{\Sigma}\right]$." should read – Re$\left[\frac{\Delta}{\Sigma}\right]$. --;

Column 4, line 30, cancel the text, "Re";

Column 4, line 32, "$\left[\frac{\Delta}{\Sigma}\right]$" should read – Re$\left[\frac{\Delta}{\Sigma}\right]$ --;

Column 4, line 55, "6(LOS)" should read – δ(LOS) --;

Column 5, lines 12, 49, and 63, for each occurrence, "δ(LOSγΔθ)" should read -- δ(LOS±Δθ) --;

Column 5, line 22, after "V_m", insert -- = -- and "V_{DR}(LOSΔθ)" should read -- V_{DR}(LOS-Δθ) --;

Column 5, line 64, "V_D(LOSγΔθ)" should read -- V_D(LOS±Δθ) --;

Column 5, line 68, after "V_{AGC}" insert -- = -- and "V_{DR}(LOS+Δθ)" should read -- V_{DR}(LOS±Δθ) --;

Column 6, line 30, "θ" should read – β --;

Column 6, line 40, "T" should read – τ --; and

Column 6, line 54, cancel the text, "RE";

Column 6, line 57, "$\left[\frac{\Delta}{\Sigma}\right]$" should read -- Re$\left[\frac{\Delta}{\Sigma}\right]$ Radio detector output --; and

Column 6, line 60, cancel the text, "Radio detector output".

PTO/SB/44 (06-07)
Approved for use through 06/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page _____ of _____

PATENT NO. :

APPLICATION NO.:

ISSUE DATE :

INVENTOR(S) :

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

MAILING ADDRESS OF SENDER (Please do not use customer number below):

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

1401 Reissue [R-3]

35 U.S.C. 251. Reissue of defective patents.

Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Director shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.

The Director may issue several reissued patents for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for a reissue for each of such reissued patents.

The provisions of this title relating to applications for patent shall be applicable to applications for reissue of a patent, except that application for reissue may be made and sworn to by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent.

The provisions of 35 U.S.C. 251 permit the reissue of a patent to correct an error in the patent made without any deceptive intention and provide criteria for the reissue. 37 CFR 1.171 through *>1.178< are rules directed to reissue.

1402 Grounds for Filing [R-5]

A reissue application is filed to correct an error in the patent which was made without any deceptive intention, where, as a result of the error, the patent is deemed wholly or partly inoperative or invalid. An error in the patent arises out of an error in conduct which was made in the preparation and/or prosecution of the application which became the patent.

There must be at least one error in the patent to provide grounds for reissue of the patent. If there is no error in the patent, the patent will not be reissued. The present section provides a discussion of what may be considered an error in the patent upon which to base a reissue application.

In accordance with 35 U.S.C. 251, the error upon which a reissue is based must be one which causes the patent to be "deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent." Thus, an error under 35 U.S.C. 251 *has not been presented* where the correction to the patent is one of spelling, or grammar, or a typographical, editorial or clerical error which does not cause the patent to be deemed wholly or partly inoperative or invalid for the reasons specified in 35 U.S.C. 251. These corrections to a patent do not provide a basis for reissue (although these corrections may also be included in a reissue application, where a 35 U.S.C. 251 error is already present).

These corrections may be made via a certificate of correction; see MPEP § 1481.

The most common bases for filing a reissue application are:

(A) the claims are too narrow or too broad;

(B) the disclosure contains inaccuracies;

(C) applicant failed to or incorrectly claimed foreign priority; and

(D) applicant failed to make reference to or incorrectly made reference to prior copending applications.

An attorney's failure to appreciate the full scope of the invention was held to be an error correctable through reissue in the decision of *In re Wilder*, 736 F.2d 1516, 222 USPQ 369 (Fed. Cir. 1984). The correction of misjoinder of inventors in divisional reissues has been held to be a ground for reissue. See *Ex parte Scudder*, 169 USPQ 814 (Bd. App. 1971).The Board of Appeals held in *Ex parte Scudder*, 169 USPQ at 815, that 35 U.S.C. 251 authorizes reissue application to correct misjoinder of inventors where 35 U.S.C. 256 is inadequate.

Reissue may no longer be necessary under the facts in *Ex parte Scudder, supra,* in view of 35 U.S.C. 116 which provides, *inter alia*, that:

> "Inventors may apply for a patent jointly even though . . . (3) each did not make a contribution to the subject matter of every claim in the patent."

See also 37 CFR 1.45(b)(3).

If the only change being made in the patent is correction of the inventorship, this can be accomplished by filing a request for a certificate of correction under the provisions of 35 U.S.C. 256 and 37 CFR 1.324. See MPEP § 1412.04 and § 1481. A Certificate of Correction will be issued if all parties are in agreement and the inventorship issue is not contested.

A reissue was granted in *Brenner v. State of Israel*, 400 F.2d 789, 158 USPQ 584 (D.C. Cir. 1968), where the only ground urged was failure to file a certified copy of the original foreign application to obtain the right of foreign priority under 35 U.S.C. 119(a)-(d) before the patent was granted.

In *Brenner*, the claim for priority had been made in the prosecution of the original patent, and it was only necessary to submit a certified copy of the priority document in the reissue application to perfect priority. Reissue is also available to convert the "error" in failing to take any steps to obtain the right of foreign priority under 35 U.S.C. 119(a)-(d) before the patent was granted. >See *Fontijn v. Okamoto*, 518 F.2d 610, 622, 186 USPQ 97, 106 (CCPA 1975) ("a patent may be reissued for the purpose of establishing a claim to priority which was not asserted, or which was not perfected during the prosecution of the original application")< In a situation where it is necessary to submit for the first time both the claim for priority and the certified copy of the priority document in the reissue application, and the patent to be reissued resulted from a utility or plant application which became the patent to be reissued was filed on or after November 29, 2000, the reissue applicant must (where it is necessary to submit for the first time the claim for priority) also file a petition for an unintentionally delayed priority claim under 37 CFR 1.55(c) in addition to filing a reissue application. See MPEP § 201.14(a).

The courts have not addressed the question of correction of the failure to adequately claim benefit under 35 U.S.C. 119(e) in the application (which became the patent to be reissued) via reissue. If the application which became the patent to be reissued was filed prior to November 29, 2000, correction as to benefit under 35 U.S.C. 119(e) would be permitted in a manner somewhat analogous to that of the priority correction discussed above. **>Where< the application, which became the patent to be reissued, was filed on or after November 29, 2000>, reissue may be employed to correct an applicant's mistake by adding or correcting a benefit claim under 35 U.S.C. 119(e). A petition under 37 CFR 1.78(a)(6) for an unintentionally delayed claim under 35 U.S.C. 119(e) would not be required in addition to filing a reissue application.<.

Section 4503 of the American Inventors Protection Act of 1999 (AIPA) amended 35 U.S.C. 119(e)(1) to state that:

> No application shall be entitled to the benefit of an earlier filed provisional application under this subsection unless an amendment containing the specific reference to the earlier filed provisional application is submitted at such time during the pendency of the application as required by the Director. The Director may consider the failure to submit such an amendment within that time period as a waiver of any benefit under this subsection. The Director may establish procedures, including the payment of a surcharge, to accept an unintentionally delayed submission of an amendment under this section ***during the pendency of the application***. (Emphasis added.)

**>The court in *Fontijn* held that 35 U.S.C. 251 was sufficiently broad to correct a patent where the applicant failed to assert or failed to perfect a claim for foreign priority during the prosecution of the original application even though 35 U.S.C. 119(b) at that time required a claim and a certified copy of the foreign application to be filed *before the patent is granted.* Similarly, the Office may grant a reissue for adding or correcting a benefit claim under 35 U.S.C.119(e) that requires the benefit claim to a provisional application be submitted *during the pendency of the application.*<.

Correction of failure to adequately claim benefit under 35 U.S.C. 120 in an earlier filed copending U.S. patent application was held a proper ground for reissue. *Sampson v. Comm'r Pat.*, 195 USPQ 136, 137 (D.D.C. 1976). If the utility or plant application which became the patent to be reissued was filed on or after November 29, 2000, the reissue applicant must file a petition for an unintentionally delayed priority claim under 37 CFR 1.78(a)(3) in addition to filing a reissue application. See MPEP § 201.11. For treatment of an error involving disclaimer of a benefit claim under 35 U.S.C. 120, see MPEP 1405. If the utility or plant application which became the patent to be reissued was filed prior to November 29, 2000 and therefore, not subject to the eighteen-month publication (e.g., one of the categories set forth in 37 CFR 1.78(a)(2)(ii)(A) – (C)), a petition for an unintentionally delayed benefit claim under 37 CFR 1.78(a)(3) would not be required to add/correct the benefit claim in the reissue application. This is so, even if the reissue application was filed on or after November 29, 2000. On the other hand, if applicant fails to file an amendment to add a claim for benefit of a prior-filed reissue application in a later-filed reissue application within the time period set forth in 37 CFR 1.78(a)(2), then a petition for an unintentionally delayed benefit claim under 37 CFR 1.78(a)(3) along with the surcharge set forth in 37 CFR 1.17(t) would be required if the later-filed reissue application is a utility or plant application filed on or after November 29, 2000 irrespective of whether the original application which became the original patent was filed prior to November 29, 2000. This is because the benefit claim is between the later-filed reissue application and the prior-filed reissue application and the benefit claim is not being added to make a correction as to a benefit of the original patent.

A reissue applicant's failure to timely file a divisional application covering the non-elected invention(s) following a restriction requirement is not considered to be error causing a patent granted on elected claims to be partially inoperative by reason of claiming less than the applicant had a right to claim. Thus, such applicant's error is not correctable by reissue of the original patent under 35 U.S.C. 251. See MPEP § 1412.01.

A reissue may be based on a drawing correction that is substantive in nature, because such a correction qualifies as correcting an "error" under 35 U.S.C. 251 that may properly be deemed to render the patent wholly or partly inoperative. A reissue application cannot be based on a non-substantive drawing change, such as a reference numeral correction or addition, the addition of shading, or even the addition of an additional figure merely to "clarify" the disclosure. Non-substantive drawing changes may, however, be included in a reissue application that corrects at least one substantive "error " under 35 U.S.C. 251.

1403 Diligence in Filing [R-3]

When a reissue application is filed within 2 years from the date of the original patent, a rejection on the grounds of lack of diligence or delay in filing the reissue should not normally be made. *Ex parte Lafferty*, 190 USPQ 202 (Bd. App. 1975); but see *Rohm & Haas Co. v. Roberts Chemical Inc.*, 142 F. Supp. 499, 110 USPQ 93 (S.W. Va. 1956), *rev'd on other grounds*, 245 F.2d 693, 113 USPQ 423 (4th Cir. 1957).

The fourth paragraph of 35 U.S.C. 251 states:

> "No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent."

Where any broadening reissue application is filed within two years from the date of the original patent, 35 U.S.C. 251 presumes diligence, and the examiner should not inquire why applicant failed to file the reissue application earlier within the two year period.

See MPEP § 1412.03 for broadening reissue practice. See also *In re Graff*, 111 F.3rd 874, 42 USPQ2d 1471 (Fed. Cir. 1997); *In re Bennett*, 766 F.2d 524, 528, 226 USPQ 413, 416 (Fed. Cir. 1985); *In re Fotland*, 779 F.2d 31, 228 USPQ 193 (Fed. Cir. 1985).

A reissue application that is filed on the 2-year anniversary date of the patent grant is considered as being filed within 2 years. See *Switzer v. Sockman*, 333 F.2d 935, 142 USPQ 226 (CCPA 1964) (a similar rule in interferences).

A reissue application can be granted a filing date without an oath or declaration, or without the >basic< filing fee>, search fee, or examination fee< being present. See 37 CFR 1.53(f). Applicant will be given a period of time to provide the missing parts and to pay the surcharge under 37 CFR 1.16(*>f<). See MPEP § 1410.01.

1404 Submission of Papers Where Reissue Patent Is in Litigation [R-2]

>Marking of envelope:< Applicants and protestors (see MPEP § 1901.03) submitting papers for entry in reissue applications of patents involved in litigation are requested to mark the outside envelope and the top right-hand portion of the papers with the words "REISSUE LITIGATION" and with the art unit or other area of the United States Patent and Trademark Office in which the reissue application is located, e.g., Commissioner for Patents, Board of Patent Appeals and Interferences, Office of Patent Legal Administration, Technology Center, Office of Patent Publication, etc. ** >Marking of papers:< Any "Reissue Litigation" papers mailed to the Office should be so marked. The markings preferably should be written in a bright color with a felt point marker. Papers marked "REISSUE LITIGATION" will be given special attention and expedited handling. >(For IFW processing, see IFW Manual.)< See MPEP § 1442.01 through § 1442.04 for examination of litigation-related reissue applications. >Protestor's participation, including the submission of papers, is limited in accordance with 37 CFR 1.291(c).<

The filing of a continued prosecution application under 37 CFR 1.53(d) of a reissue application will not be announced in the *Official Gazette*. Although the filing of a continued prosecution application of a reissue application constitutes the filing of a reissue application, the announcement of the filing of such continued prosecution application would be redundant in view of the announcement of the filing of the prior reissue application in the *Official Gazette*.

37 CFR 1.11(b) is applicable **>to all< reissue applications filed on or after March 1, 1977. Those reissue applications previously on file will not be automatically open to inspection but a liberal policy will be followed in granting petitions for access to such applications.

**>IFW reissue application files are open to inspection by the general public by way of Public PAIR via the USPTO Internet site. In viewing the images of the files, members of the public will be able to view the entire content of the reissue application file history. To access Public PAIR, a member of the public would (A) go to the USPTO web site at http://www.uspto.gov, (B) click on "Patents," (C) under "Check Status, View Papers..." click on "Status & IFW," and (D) under "Patent Application Information Retrieval" enter the reissue application number.

Access to a reissue application that is maintained in paper must be obtained from the area of the Office having jurisdiction over the file. The following access procedure will be observed for reissue application files that are maintained in paper:

(A) Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice. (Reissue applications already on file prior to March 1, 1977 are not automatically open to inspection, but a liberal policy is followed by the Office of Patent Legal Administration (OPLA) and by the Board of Patent Appeals and Interferences in granting petitions for access to such applications.);

(B) Paper reissue application files will be maintained in the TCs and inspection thereof will be supervised by TC personnel. A TC Director or other appropriate Office official may, under appropriate circumstances, postpone access to or the making of copies of a paper reissue application file, in order, for example, to avoid interruption of the examination or other review of the application by an examiner. In addition, though no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitations, if necessary, e.g., where the application is actively being processed;

(C) In any instance where the reissue application file has left the TC for administrative processing, requests for access should be directed to the appropriate supervisory personnel where the application is currently located;<

(D) A >paper< reissue application file is not available to the public once the reissue application file has been released and forwarded by the TC for publication of the reissue patent. This would include any reissue application files which have been selected for a post-allowance screening at **>OPLA<. Unless prosecution is reopened pursuant to the screening, the reissue application files are not available to the public until the reissue patent issues. This is because the reissue application file has been put into a special format for printing purposes and public access at this stage would disrupt the publication process;

(E) Requests for copies of papers in the reissue application file must be in writing addressed to Mail Stop Document Services, Director of the U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. Such requests may be either mailed or delivered to the Customer Service Window. The price for a copy of an application as filed is set forth in 37 CFR 1.19(b)(1). Since no useful purpose is seen for retaining such written requests for copies of papers in reissue applications, the request(s) should be destroyed after the order has been completed.

See also MPEP § 103.

1480 Certificates of Correction — Office Mistake [R-3]

35 U.S.C. 254. Certificate of correction of Patent and Trademark Office mistake.

Whenever a mistake in a patent, incurred through the fault of the Patent and Trademark Office, is clearly disclosed by the records of the Office, the Director may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A printed copy thereof shall be attached to each printed copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with such certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Director may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

37 CFR 1.322. Certificate of correction of Office mistake.

(a)(1) The Director may issue a certificate of correction pursuant to 35 U.S.C. 254 to correct a mistake in a patent, incurred through the fault of the Office, which mistake is clearly disclosed in the records of the Office:

(i) At the request of the patentee or the patentee's assignee;

(ii) Acting *sua sponte* for mistakes that the Office discovers; or

(iii) Acting on information about a mistake supplied by a third party.

(2)(i) There is no obligation on the Office to act on or respond to a submission of information or request to issue a certificate of correction by a third party under paragraph (a)(1)(iii) of this section.

(ii) Papers submitted by a third party under this section will not be made of record in the file that they relate to nor be retained by the Office.

(3) **>If the request relates to a patent involved in an interference, the request must comply with the requirements of this section and be accompanied by a motion under § 41.121(a)(2) or § 41.121(a)(3) of this title.<

(4) The Office will not issue a certificate of correction under this section without first notifying the patentee (including any assignee of record) at the correspondence address of record as specified in § 1.33(a) and affording the patentee or an assignee an opportunity to be heard.

(b) If the nature of the mistake on the part of the Office is such that a certificate of correction is deemed inappropriate in form, the Director may issue a corrected patent in lieu thereof as a more appropriate form for certificate of correction, without expense to the patentee.

Mistakes incurred through the fault of the Office may be the subject of Certificates of Correction under 37 CFR 1.322. The Office, however, has discretion under 35 U.S.C. 254 to decline to issue a Certificate of Correction even though an Office mistake exists. If Office mistakes are of such a nature that the meaning intended is obvious from the context, the Office may decline to issue a certificate and merely place the correspondence in the patented file, where it serves to call attention to the matter in case any question as to it subsequently arises. Such is the case, even where a correction is requested by the patentee or patentee's assignee.

In order to expedite all proper requests, a Certificate of Correction should be requested only for errors of consequence. Instead of a request for a Certificate of Correction, letters making errors of record should be utilized whenever possible. Thus, where errors are of a minor typographical nature, or are readily apparent to one skilled in the art, a letter making the error(s) of record can be submitted in lieu of a request for a Certificate of Correction. There is no fee for the submission of such a letter.

It is strongly advised that the text of the correction requested be submitted on a Certificate of Correction form, PTO/SB/44 (also referred to as PTO 1050). Submission of this form in duplicate is not necessary. The location of the error in the printed patent should be identified on form PTO/SB/44 by column and line number or claim and line number. See MPEP § 1485 for a discussion of the preparation and submission of a request for a Certificate of Correction.

A request for a Certificate of Correction should be addressed to:

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

>

I. < THIRD PARTY INFORMATION ON MISTAKES IN PATENT

Third parties do not have standing to demand that the Office issue, or refuse to issue, a Certificate of Correction. *See Hallmark Cards, Inc. v. Lehman*, 959 F. Supp. 539, 543-44, 42 USPQ2d 1134, 1138 (D.D.C. 1997). 37 CFR 1.322(a)(2) makes it clear that third parties do not have standing to demand that the Office act on, respond to, issue, or refuse to issue a Certificate of Correction. The Office is, however, cognizant of the need for the public to have correct information about published patents and may therefore accept information about mistakes in patents from third parties. 37 CFR 1.322(a)(1)(iii). Where appropriate, the Office may issue certificates of correction based on information supplied by third parties, whether or not such information is accompanied by a specific request for issuance of a Certificate of Correction.

While third parties are permitted to submit information about mistakes in patents which information will be reviewed, the Office need not act on that information nor deny any accompanying request for issuance of a Certificate of Correction. Accordingly, a fee for submission of the information by a third party has not been imposed. The Office may, however, choose to issue a Certificate of Correction on its own initiative based on the information supplied by a third party, if it desires to do so. Regardless of whether the third party information is acted upon, the information will not be made of record in the file that it relates to, nor be retained by the Office. 37 CFR 1.322(a)(2)(ii).

When such third party information (about mistakes in patents) is received by the Office, the Office will not correspond with third parties about the information they submitted either (1) to inform the third parties of whether it intends to issue a Certificate of Correction, or (2) to issue a denial of any request for issuance of a Certificate of Correction that may accompany the information. The Office will confirm to the party submitting such information that the Office has in fact received the information if a stamped, self-addressed post card has been submitted. See MPEP § 503.

>

II. < PUBLICATION IN THE *OFFICIAL GAZETTE*

Each issue of the *Official Gazette* (patents section) numerically lists all United States patents having Certificates of Correction. The list appears under the heading "Certificates of Correction for the week of (date)."

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1480.01 Expedited Issuance of Certificates of Correction - Error Attributable to Office [R-2]

In an effort to reduce the overall time required in processing and granting Certificate of Correction requests, the Office will expedite processing and granting of patentee requests where such requests are accompanied by evidence to show that the error is attributable solely to the Office (i.e., requests filed pursuant to 37 CFR 1.322 only).

The following requirements must be met for consideration of expedited issuance of Certificates of Correction:

The text of the correction requested should be submitted on a Certificate of Correction form, PTO/SB/44 (also referred to as PTO 1050). Submission of this form in duplicate is not necessary. The location of the error in the printed patent should be identified on form PTO/SB/44 by column and line number or claim and line number. See also MPEP § 1485.

Where the correction requested was incurred through the fault of the Office, and the matter is clearly disclosed in the records of the Office, and is accompanied by documentation that unequivocally supports the patentee's assertion(s), a Certificate of Correction will be expeditiously issued. Such supporting documentation can consist of relevant photocopied receipts, manuscript pages, correspondence dated and received by the Office, photocopies of Examiners' responses regarding entry of amendments, or any other validation that supports the patentee's request so that the request can be processed without the patent file.

Where only part of a request can be approved, the appropriate modifications will be made on the form PTO/SB/44 and the patentee then notified by mail. Further consideration will be given to initially rejected requests upon a request for reconsideration. In this instance, however, or in the case where it is determined that the Office was not responsible for the error(s) cited by the patentee, accelerated issuance of Certificates of Correction cannot be anticipated (although the Office will make every effort to process the request expeditiously).

As in the case of a request for a Certificate of Correction, a Request for Expedited Issuance of Certificate of Correction should be addressed to:

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450<

1481 Certificates of Correction - Applicant's Mistake [R-3]

35 U.S.C. 255. Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent and Trademark Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Director may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. Such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter to issue a Certificate of Correction on its own initiative based on the information supplied by a third party, if it desires to do so. Regardless of whether the third party information is acted upon, the information will not be made of record in the file that it relates to, nor be retained by the Office. 37 CFR 1.322(a)(2)(ii).

When such third party information (about mistakes in patents) is received by the Office, the Office will not correspond with third parties about the information they submitted either (1) to inform the third parties of whether it intends to issue a Certificate of Correction, or (2) to issue a denial of any request for issuance of a Certificate of Correction that may accompany the information. The Office will confirm to the party submitting such information that the Office has in fact received the information if a stamped, self-addressed post card has been submitted. See MPEP § 503.

>

II. < PUBLICATION IN THE *OFFICIAL GAZETTE*

Each issue of the *Official Gazette* (patents section) numerically lists all United States patents having Certificates of Correction. The list appears under the heading "Certificates of Correction for the week of (date)."

>

1480.01 Expedited Issuance of Certificates of Correction - Error Attributable to Office [R-2]

In an effort to reduce the overall time required in processing and granting Certificate of Correction requests, the Office will expedite processing and granting of patentee requests where such requests are accompanied by evidence to show that the error is attributable solely to the Office (i.e., requests filed pursuant to 37 CFR 1.322 only).

The following requirements must be met for consideration of expedited issuance of Certificates of Correction:

The text of the correction requested should be submitted on a Certificate of Correction form, PTO/SB/44 (also referred to as PTO 1050). Submission of this form in duplicate is not necessary. The location of the error in the printed patent should be identified on form PTO/SB/44 by column and line number or claim and line number. See also MPEP § 1485.

Where the correction requested was incurred through the fault of the Office, and the matter is clearly disclosed in the records of the Office, and is accompanied by documentation that unequivocally supports the patentee's assertion(s), a Certificate of Correction will be expeditiously issued. Such supporting documentation can consist of relevant photocopied receipts, manuscript pages, correspondence dated and received by the Office, photocopies of Examiners' responses regarding entry of amendments, or any other validation that supports the patentee's request so that the request can be processed without the patent file.

Where only part of a request can be approved, the appropriate modifications will be made on the form PTO/SB/44 and the patentee then notified by mail. Further consideration will be given to initially rejected requests upon a request for reconsideration. In this instance, however, or in the case where it is determined that the Office was not responsible for the error(s) cited by the patentee, accelerated issuance of Certificates of Correction cannot be anticipated (although the Office will make every effort to process the request expeditiously).

As in the case of a request for a Certificate of Correction, a Request for Expedited Issuance of Certificate of Correction should be addressed to:

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450<

1481 Certificates of Correction - Applicant's Mistake [R-3]

35 U.S.C. 255. Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent and Trademark Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Director may, upon payment of the required fee, issue a certificate of correction, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. Such patent, together with the certificate, shall have the same effect and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form.

37 CFR 1.323. Certificate of correction of applicant's mistake.

**>The Office may issue a certificate of correction under the conditions specified in 35 U.S.C. 255 at the request of the patentee or the patentee's assignee, upon payment of the fee set forth in § 1.20(a). If the request relates to a patent involved in an interference, the request must comply with the requirements of this section and be accompanied by a motion under § 41.121(a)(2) or § 41.121(a)(3) of this title.<

37 CFR 1.323 relates to the issuance of Certificates of Correction for the correction of errors which were not the fault of the Office. Mistakes in a patent which are not correctable by Certificate of Correction may be correctable via filing a reissue application (see MPEP § 1401 - § 1460). See *Novo Industries, L.P. v. Micro Molds Corporation*, 350 F.3d 1348, 69 USPQ2d 1128 (Fed. Cir. 2003) (The Federal Circuit stated that when Congress in 1952 defined USPTO authority to make corrections with prospective effect, it did not deny correction authority to the district courts. A court, however, can correct only if "(1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation...").

In re Arnott, 19 USPQ2d 1049, 1052 (Comm'r Pat. 1991) specifies the criteria of 35 U.S.C. 255 (for a Certificate of Correction) as follows:

> Two separate statutory requirements must be met before a Certificate of Correction for an applicant's mistake may issue. The first statutory requirement concerns the nature, i.e., type, of the mistake for which a correction is sought. The mistake must be:
>
> (1) of a clerical nature,
>
> (2) of a typographical nature, or
>
> (3) a mistake of minor character.
>
> The second statutory requirement concerns the nature of the proposed correction. The correction must not involve changes which would:
>
> (1) constitute new matter or
>
> (2) require reexamination.

If the above criteria are not satisfied, then a Certificate of Correction for an applicant's mistake will not issue, and reissue must be employed as the vehicle to "correct" the patent. Usually, any mistake affecting claim scope must be corrected by reissue.

A mistake is not considered to be of the "minor" character required for the issuance of a Certificate of Correction if the requested change would materially affect the scope or meaning of the patent. See also MPEP § 1412.04 as to correction of inventorship via certificate of correction or reissue.

The fee for providing a correction of applicant's mistake, other than inventorship, is set forth in 37 CFR 1.20(a). The fee for correction of inventorship in a patent is set forth in 37 CFR 1.20(b).

**>

1481.01 Correction of Assignees' Names [R-3]

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The **>Fee(s)< Transmittal Form portion (PTOL-85B) of the Notice of Allowance provides a space (item 3) for assignment data which should be completed in order to comply with 37 CFR 3.81. Unless an assignee's name and address are identified in the appropriate space for specifying the assignee, (i.e., item 3 of the **>Fee(s)< Transmittal Form PTOL-85B), the patent will issue to the applicant. Assignment data printed on the patent will be based solely on the information so supplied.

**>Any request for the issuance of an application in the name of the assignee submitted after the date of payment of the issue fee, and any request for a patent to be corrected to state the name of the assignee must:

(A) state that the assignment was submitted for recordation as set forth in 37 CFR 3.11 before issuance of the patent;

(B) include a request for a certificate of correction under 37 CFR 1.323 along with the fee set forth in 37 CFR 1.20(a); and

(C) include the processing fee set forth in 37 CFR 1.17(i).

See 37 CFR 3.81(b).

1481.02 Correction of Inventors' Names [R-3]

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35 U.S.C. 256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Director may, on application of all the parties and

If all the above-stated conditions are satisfied, a Certificate of Correction can be used to amend the patent to make reference to a prior copending application, or to correct an incorrect reference to the prior copending application, for benefit claims under 35 U.S.C. 120 and 365(c).

If any of the above-stated conditions is not satisfied, the filing of a reissue application (see MPEP § 1401 - § 1460) may be appropriate to pursue the desired correction of the patent for benefit claims under 35 U.S.C. 120 and 365(c).

1485 Handling of Request for Certificates of Correction [R-5]

A request for a Certificate of Correction should be addressed to:

>Commissioner for Patents
Office of Patent Publication<
ATTN: Certificate of Correction Branch
**
P.O. Box 1450
Alexandria, VA 22313-1450

Requests for Certificates of Correction will be forwarded to the Certificate of Correction Branch of the Office of Patent Publication, where they will be listed in a permanent record book.

If the patent is involved in an interference, a Certificate of Correction under 37 CFR 1.324 will not be issued unless a corresponding motion under 37 CFR 41.121(a)(2) or 41.121(a)(3) has been granted by the administrative patent judge. Otherwise, determination as to whether an error has been made, the responsibility for the error, if any, and whether the error is of such a nature as to justify the issuance of a Certificate of Correction will be made by the Certificate of Correction Branch. If a report is necessary in making such determination, the case will be forwarded to the appropriate group with a request that the report be furnished. If no certificate is to issue, the party making the request is so notified and the request, report, if any, and copy of the communication to the person making the request are placed in the file wrapper (for a paper file) or entered into the file history (for an IFW file), and entered into the "Contents" for the file by the Certificate of Correction Branch. The case is then returned to the patented files. If a certificate is to issue, it will be prepared and forwarded to the person making the request by the Office of Patent Publication. In that case, the request, the report, if any, and a copy of the letter transmitting the Certificate of Correction to the person making the request will be placed in the file wrapper (for a paper file) or entered into the file history (for an IFW file), and entered into the "Contents" for the file.

Applicants, or their attorneys or agents, are urged to submit the text of the correction on a special Certificate of Correction form, PTO/SB/44 (also referred to as Form PTO-1050), which can serve as the camera copy for use in direct offset printing of the Certificate of Correction.

Where only a part of a request can be approved, or where the Office discovers and includes additional corrections, the appropriate alterations are made on the form PTO/SB/44 by the Office. The patentee is notified of the changes on the Notification of Approval-in-part form PTOL-404. The certificate is issued approximately 6 weeks thereafter.

Form PTO/SB/44 should be used exclusively regardless of the length or complexity of the subject matter. Intricate chemical formulas or page of specification or drawings may be reproduced and mounted on a blank copy of PTO/SB/44. Failure to use the form has frequently delayed issuance since the text must be retyped by the Office onto a PTO/SB/44.

The exact page and line number where the errors occur in the application file should be identified on the request. However, on form PTO/SB/44, only the column and line number in the printed patent should be used.

The patent grant should be retained by the patentee. The Office does not attach the Certificate of Correction to patentee's copy of the patent. The patent grant will be returned to the patentee if submitted.

Below is a sample form illustrating a variety of corrections and the suggested manner of setting out the format. Particular attention is directed to:

(A) Identification of the exact point of error by reference to column and line number of the printed patent for changes in the specification or to claim number and line where a claim is involved.

(B) Conservation of space on the form by typing single space, beginning two lines down from the printed message.

(C) Starting the correction to each separate column as a sentence, and using semicolons to separate corrections within the same column, where possible.

(D) Leaving a two-inch space blank at bottom of the last sheet for the signature of the attesting officer.

(E) Using quotation marks to enclose the exact subject matter to be deleted or corrected; using double hyphens (-- --) to enclose subject matter to be added, except for formulas.

(F) Where a formula is involved, setting out only that portion thereof which is to be corrected or, if necessary, pasting a photocopy onto form PTO/SB/44.

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

**>

Patent No.	:9,999,999
Application No.	:10/999,999
Issue Date	:May 1, 2002
Inventor(s)	:Eli Y. Rosenthal

<

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the drawings, Sheet 3, Fig. 3, the reference numeral 225 should be applied to the plate element attached to the support member 207:

Column 2, line 68 and column 3, lines 3, 8 and 13, for the claim reference numeral '2', each occurrence, should read -1-.

Column 7, lines 45 to 49, the left-hand formula should appear as follows:

$-R_3$-CHF

Column 8, Formula XVII, that portion of the formula reading "-CHClCH-" should read --CHFCH$_2$ --; line 5, "chlorine" should be changed to --fluorine--.

Column 10, line 29, cancel the text beginning with "12. A sensor device" to and ending "active strips." in column 11, line 10, and insert the following claim:

12. A control circuit of the character set forth in claim 4 and for an automobile having a convertible top, and including; means for moving the top between a raised and lowered retracted position; and control means responsive to a sensor relay for energizing the top moving means for moving said top from a retracted position to a raised position.

ELECTRONIC PUBLICATION OF CERTIFICATES OF CORRECTION WITH LATER LISTING IN THE *OFFICIAL GAZETTE*

Effective August 2001, the U.S. Patent and Trademark Office (USPTO) publishes on the USPTO web site at http://www.uspto.gov/web/patents/certofcorrect a listing by patent number of the patents for which certificates of correction are being issued.

The USPTO is now automating the publication process for certificates of correction. This new process will result in certificates of correction being published quicker electronically on the USPTO's web site as compared to their paper publication and the listing of the certificates of correction in the *Official Gazette*. Under the newly automated process, each issue of certificates of correction will be electronically published on the USPTO web site at http://www.uspto.gov/web/patents/certofcorrect, and will also subsequently be listed in the *Official Gazette* (and in the *Official Gazette Notices* posted at http://www.uspto.gov/web/offices/com/sol/og) approximately three weeks thereafter. The listing of certificates of correction in the *Official Gazette* will include the certificate's date of issuance.

On the date on which the listing of certificates of correction is electronically published on the USPTO web site: (A) the certificate of correction will be entered into the file wrapper of a paper-file patent, or entered into the file history of an IFW-file patent and will be available to the public; (B) a printed copy of the certificate of correction will be mailed to the patentee or the patent's assignee; and (C) an image of the printed certificate of correction will be added to the image of the patent on the patent database at http://www.uspto.gov.patft. Dissemination of all other paper copies of the certificate of correction will occur shortly thereafter.

The date on which the USPTO makes the certificate of correction available to the public (e.g., by adding the certificate of correction to the file wrapper/file history) will be regarded as the date of issuance of the certificate of correction, not the date of the certificate of correction appearing in the *Official Gazette*. (For IFW processing, see IFW Manual.) Certificates of correction published in the above-described manner will provide the public with prompt notice and access, and this is consistent with the legislative intent behind the American Inventors Protection Act of 1999. See

35 U.S.C. 10(a) (authorizing the USPTO to publish in electronic form).

The listing of certificates of correction can be electronically accessed on the day of issuance at http://www.uspto.gov/web/patents/certofcorrect. The electronic image of the printed certificate of correction can be accessed on the patent database at http://www.uspto.gov/patft and the listing of the certificates of correction, as published in the *Official Gazette* three weeks later, will be electronically accessible at http://www.uspto.gov/web/offices/com/sol/og.

PTO/SB/44 (04-05)
Approved for use through 04/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page _____ of _____

PATENT NO. :

APPLICATION NO.:

ISSUE DATE :

INVENTOR(S) :

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

MAILING ADDRESS OF SENDER (Please do not use customer number below):

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EXHIBIT E

#35

OIPE IAP63
AUG 06 2007
PATENT & TRADEMARK OFFICE

ALTON B. HORNBACK
5650 Bloch Street
San Diego, CA 92122
(858) 453-3334
2 August 2007

Petition 088.

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Post Office Box 1450
Alexandria, VA 22313-1450

Attn: Brian Hearn

Subject: Amended Petition to Reissue Patent No. 6,079,666 so that it Conforms to Allowed Patent Application No. 06/859,033, Filed: 25 April 1986; Issued: 27 June 2000.

Sir:

This letter, together with five Enclosures and two Attachments, constitutes a reply to your letter of 25 July 2007, Re: Reissue of subject patent so that it conforms to allowed patent application.

Enclosure 1 is a copy of Patent No. 6,079,666. Enclosure 2 is a copy of allowed Patent Application No. 06/859,033, less allowed Claims 3-6 (now, 1-4). Enclosure 3 is a copy of "SUPPLEMENTAL Amendment A CLASSIFIED ANNEX", which was mailed 6 May 1987 and contained Amended Claims 3-6; that SUPPLEMENTAL Amendment A was stamped by the PTO as "RECEIVED May 11 1987 GROUP 220 LICENSING & REVIEW". Enclosure 4 is a copy of a PTO communication which shows that, on 5/11/87, the PTO filed that communication, and thereafter, on 05-27-87 (Id., at 2) allowed Claims 3-6.

Attachment 1, included in your letter of 25 July 2007, is a copy of the errors in the patent specifications which the PTO, itself, has certified must be corrected so that Patent No. 6,079,666 conforms to Patent Application No. 06/859,033. To that end, in your letter at 3, you stated: "Therefore, pursuant to 37 CFR 1.322, the Office intends to issue the attached certificate of correction. ... The USPTO regrets the error and inconvenience".

Attachment 2 is a copy of the errors in the patent claims which must be corrected so that the patent conforms to the application.

From the above, Petitioner submits that: (i) those errors were, without exception, the fault of the PTO; (ii) the nature and extent of those errors are such that a "Certificate of Correction" is clearly inappropriate in form; and (iii) the invention described in the issued patent is not the same invention as that disclosed in the allowed patent application, and therefore, the PTO should either issue a new patent pursuant to 35 U.S.C. 131, or a corrected patent pursuant to 37 CFR 1.322(b).

Alternatively, if the PTO can show that any error in either the patent specifications or patent claims is the fault of Petitioner, then it should do so, and reissue the corrected patent pursuant to 35 U.S.C. 251, quality control and the above-noted apology for the inconvenience to Petitioner, notwithstanding. In that unlikely event, Petitioner has enclosed a check (Enclosure 5) in the amount of $395.00 as the required "small entity" reissue fee.

Respectfully submitted.

Alton B. Hornback

Alton B. Hornback, Petitioner

Attachments: 2 as noted.
Enclosures: 5 as noted.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,079,666
APPLICATION NO.: 06/859,033
DATED : June 27, 2000
INVENTOR(S) : Alton B. Hornback

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the specification, column 2, line 2, "statistic" should read -- statistics --;

Column 3, line 7, "(e)" should read -- (d) --;

Column 3, line 9, "(f)" should read -- (e) --;

Column 4, line 12, cancel the text, "Re";

Column 4, line 14, "$\left[\frac{\Delta}{\Sigma}\right]$." should read -- Re $\left[\frac{\Delta}{\Sigma}\right]$. --;

Column 4, line 30, cancel the text, "Re";

Column 4, line 32, "$\left[\frac{\Delta}{\Sigma}\right]$" should read -- Re $\left[\frac{\Delta}{\Sigma}\right]$ --;

Column 4, line 55, "6(LOS)" should read -- δ(LOS) --;

Column 5, lines 12, 49, and 63, for each occurrence, "δ(LOSγΔθ)" should read -- δ(LOS±Δθ) --;

Column 5, line 22, after "V_m", insert -- = -- and "V_{DR}(LOSΔθ)" should read -- V_{DR}(LOS-Δθ) --;

Column 5, line 64, "V_D(LOSγΔθ)" should read -- V_D(LOS±Δθ) --;

Column 5, line 68, after "V_{AGC}" insert -- = -- and "V_{DR}(LOS+Δθ)" should read -- V_{DR}(LOS±Δθ) --;

Column 6, line 30, "$\dot{\theta}$" should read -- $\dot{\beta}$ --;

Column 6, line 40, "T" should read -- τ --; and

Column 6, line 54, cancel the text, "RE";

Column 6, line 57, "$\left[\frac{\Delta}{\Sigma}\right]$" should read -- Re $\left[\frac{\Delta}{\Sigma}\right]$ ~~Radio~~ Ratio detector output --; and

Column 6, line 60, cancel the text, "~~Radio~~ Ratio detector output".

E N C L O S U R E S

ENCLOSURE 1

US006079666A

United States Patent [19]

Hornback

[11] Patent Number: 6,079,666

[45] Date of Patent: Jun. 27, 2000

[54] REAL TIME BORESIGHT ERROR SLOPE SENSOR

[76] Inventor: Alton B. Hornback, 5650 Bloch St., San Diego, Calif. 92122

[21] Appl. No.: 06/859,033

[22] Filed: Apr. 25, 1986

[51] Int. Cl.[7] F41G 7/00

[52] U.S. Cl. 244/3.19; 244/3.16; 244/3.15

[58] Field of Search 244/3.19, 3.15, 244/3.16

[56] References Cited

U.S. PATENT DOCUMENTS

4,303,211 12/1981 Dooley et al. 244/3.19

OTHER PUBLICATIONS

Waymeyer, W. K. and Macala, G. A., "Intercept Guidance and Control Concepts Demonstration", AFATL-TR-79-59, pp. 74-79, Feb. 1978.

Yost, D. J., Weckesser, L. B. and Mallalieu, R. C., "Technology Survey of Radomes for Anti-Air Homing Missiles", FS-80-022, Johns Hopkins University Applied Physics Laboratory, Mar. 1980.

Primary Examiner—Charles T. Jordan

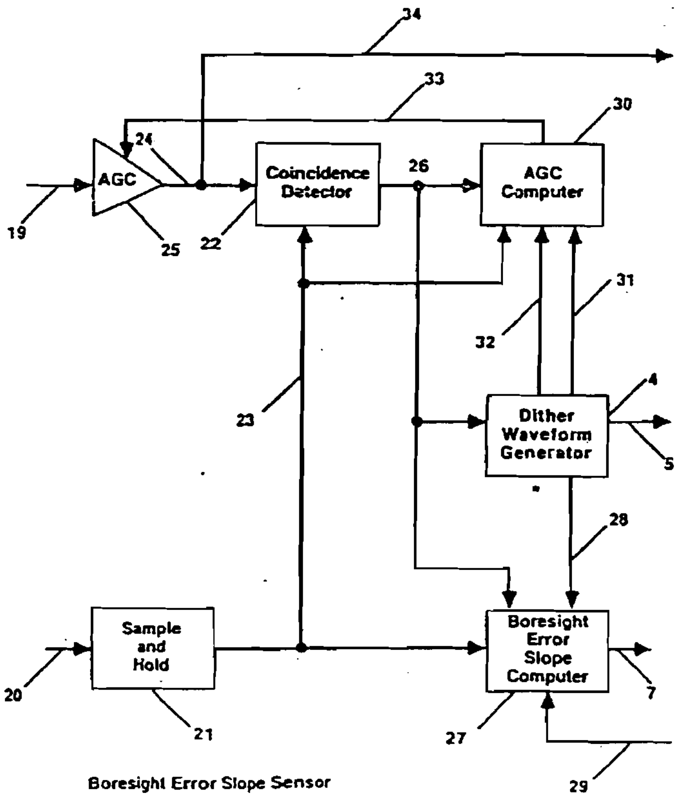
Assistant Examiner—Theresa M. Wesson

[57] ABSTRACT

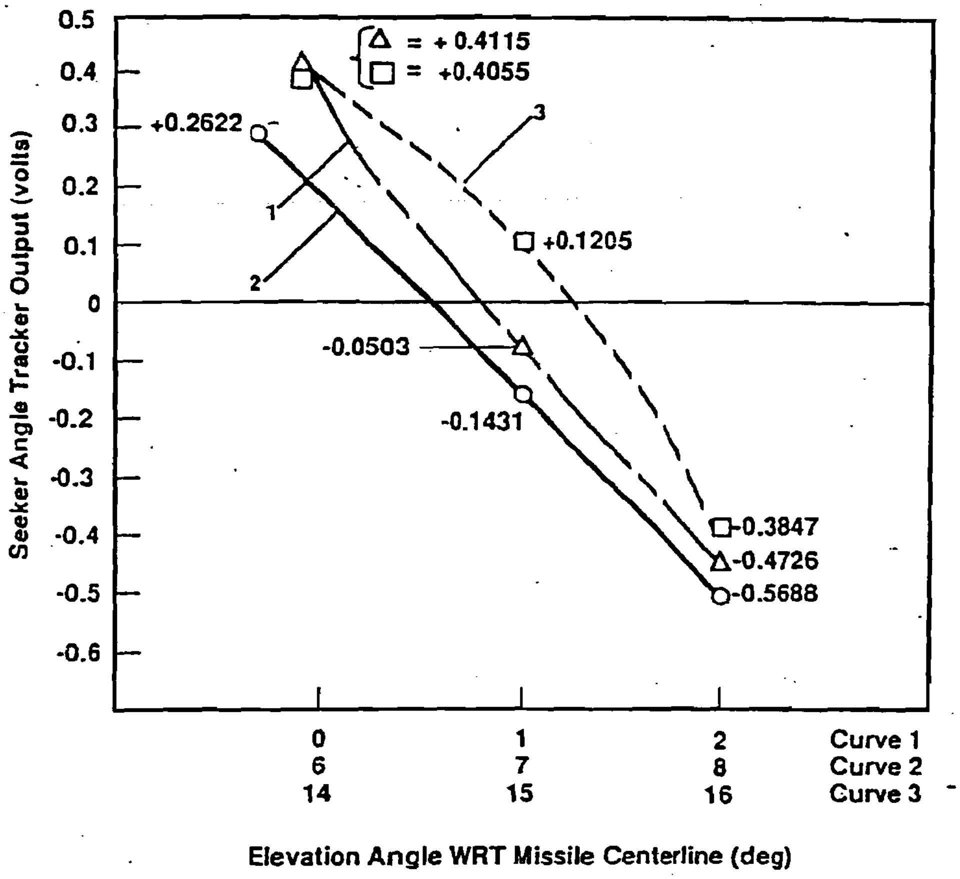
In a missile which employs a terminal homing seeker and a proportional navigation guidance law the space rate of change of boresight error, i.e., the boresight error slope, is one of the predominant error sources.

It has been found that the boresight error slope is proportional to the curvature of the seeker open loop transfer characteristic. Accordingly, the boresight error slope sensor senses the curvature of the seeker open loop transfer characteristic. This is accomplished by intermittently dithering the seeker instantaneous field-of-view about the line of sight at a rate too great for the normal tracking loop to respond. Thus the open loop transfer characteristic is obtained while leaving the normal tracking loop unperturbed. The curvature of the open loop transfer characteristic is then obtained in real time by computing the "second differences" from the measured open loop transfer characteristic.

4 Claims, 3 Drawing Sheets

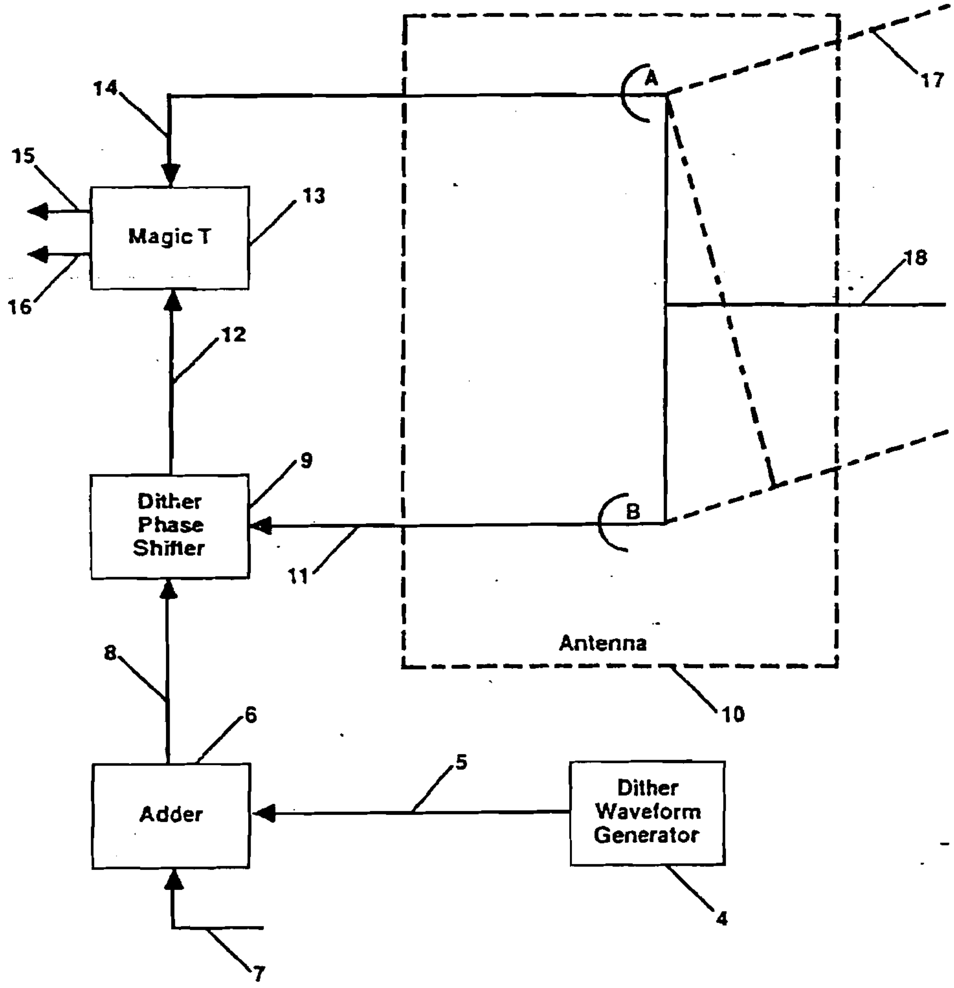


Boresight Error Slope Sensor



0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Seeker Angle Tracker Output (volts)
Δ = + 0.4115
□ = +0.4055
+0.2622
3
1
2
+0.1205
-0.0503
-0.1431
-0.3847
-0.4726
-0.5688
0 6 14
1 7 15
2 8 16
Curve 1
Curve 2
Curve 3
Elevation Angle WRT Missile Centerline (deg)

Figure 1. Transfer Characteristics



14
15
16
Magic T
13
12
A
17
18
9
Dither Phase Shifter
B
11
Antenna
8
10
6
5
Adder
Dither Waveform Generator
4
7

Figure 2. Beam Dither Generator

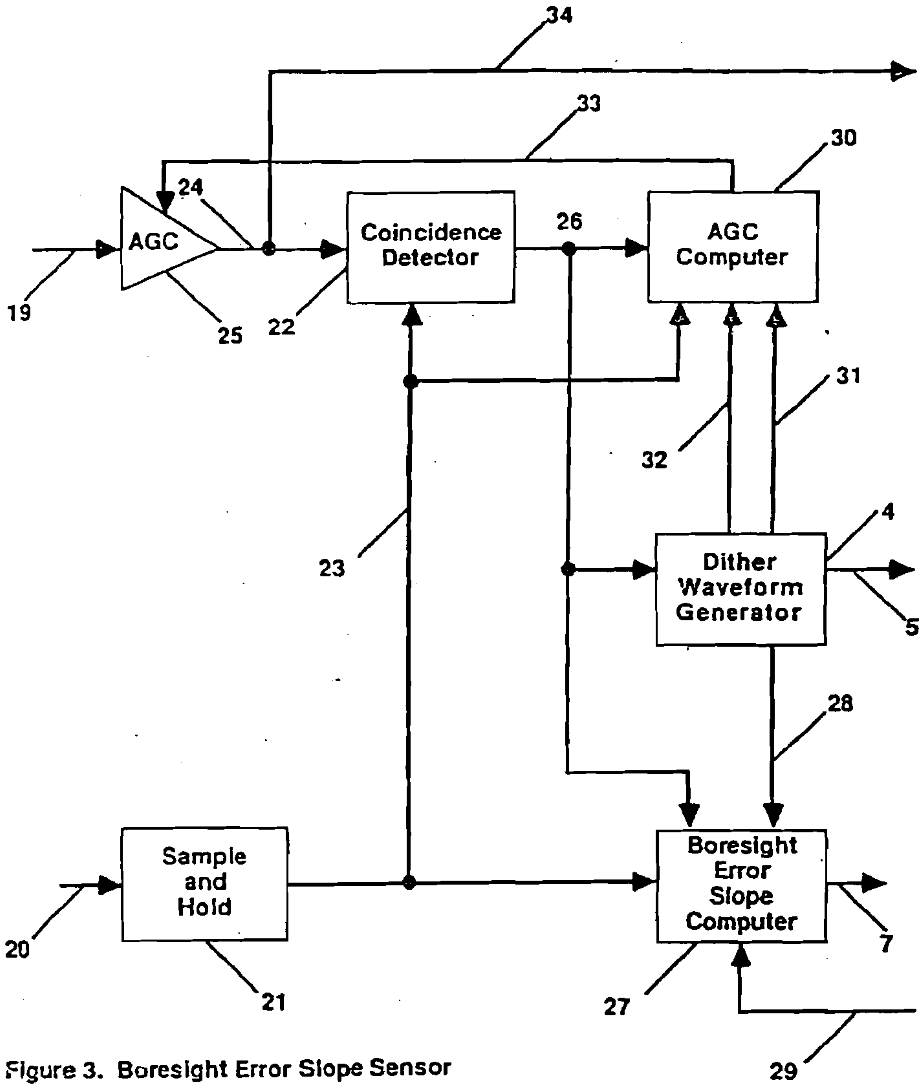

34
33
30
24
AGC
Coincidence Detector
26
AGC Computer
19
25
22
31
32
23
4
Dither Waveform Generator
5
28
Sample and Hold
Boresight Error Slope Computer
20
21
27
7
29

Figure 3. Boresight Error Slope Sensor

REAL TIME BORESIGHT ERROR SLOPE SENSOR

1.0 BACKGROUND

1.1 Field of the Invention

This invention is in the field of missile guidance and relates to a device which senses, in real time, the boresight error slope.

1.2 The Prior Art

In a missile which employs a terminal homing seeker and a proportional navigation guidance law, the space rate of change of boresight error, i.e., the boresight error slope, is one of the predominant error sources. This slope is defined as a small change in boresight error divided by a small change in aspect angle. With a proportional navigation guidance law, it is required that the line-of sight (LOS) to the target not rotate in inertial space. Thus an error in line-of sight rate rather than an error in LOS angle, per se, is the predominamt error. When the boresight error slope (denoted by m) is multiplied by body rate (denoted by $\dot{\theta}$) an error in LOS rate (denoted by $\Delta\dot{\beta}$) is produced. Since $\Delta\dot{\beta}$ is in a parasitic loop from body rate to apparent target motion, through the guidance gain, and back to body rate it can cause erratic instabilities.

Various approaches have been used to minimize either the boresight error slope or its effect on missile guidance. These include:

a. Reducing guidance loop gain or increasing guidance time constant. This compromises guidance accuracy.

b. Controlling radome wall thickness during the fabrication process by machine grinding or forming. This is expensive, time consuming, and usually yields a boresight error slope greater than about 0.06 degrees per degree.

c. Preflight mapping the boresight errors, storing these errors in a look-up table and actively compensating for the errors during flight. Although residual errors after compensation have been measured as low as 0.01 deg/deg this is very expensive since each radome must be individually mapped. Also, this does not compensate for inflight variation of errors.

d. Opening the guidance loop and introducing a known dither, in both pitch and yaw, of the body axis about the velocity vector while the seeker is still tracking the target. The measured LOS rate is then compared with that expected from the known dither rate to obtain the LOS rate error. This technique may introduce oscillation into an otherwise marginally stable missile. It takes considerable time and energy because of the two-axis dither. The dither is necessarily slow because of missile response time; therefore the data may not be in real time for hypersonic flight where the radome statistics are changing rapidly. This method has never been tested.

It has been found that for supersonic flight at high altitude with low aerodynamic q, a boresight error slope (m)<0.01 deg/deg is required to prevent the parasitic loop from causing the missile to go unstable. Thus the foregoing approaches to reducing m may not be satisfactory.

2.0 OBJECTS AND ADVANTAGES

The real time boresight error slope sensor described herein is an inexpensive device capable of reducing the line-of-sight rate errors contributed by the radome or IR dome in real time from whatever the cause. The various sources of nonzero m include those arising from aerodynamic heating from supersonic or hypersonic flight such as ablation, plasma, char and erosion, as well as those from external sources such as frequency agility or irradiation by a high energy laser. This is accomplished in real time which is necessary if the dome statistic are time varying.

3.0 DRAWING FIGURES

FIG. 1 shows the nonlinearity of three characteristic curves for three different look angles.

FIG. 2 is a functional block diagram of the antenna beam dither generator.

FIG. 3 is a functional block diagram of the boresight error slope sensor with a scale factor (AGC) correction loop.

4.0 PHYSICAL PRINCIPLE

During a research program to employ a microwave RF (radio frequency) seeker in a hypersonic missile, this inventor discovered that the curvature of the seeker open loop transfer characteristic (i.e. output voltage vs. look angle measured from electrical boresight) was proportional to the boresight error slope. The pertinent results of this research are shown in FIG. 1. Curve 1 shows that the transfer characteristic is slightly curved upward (concave) at a look angle of 1 deg off the nose where the boresight error slope m, was found to be +0.05 deg/deg. Curve 2 shows that the transfer characteristic is a straight line at an LOS=7 deg where m=0. Curve 3 shows that the transfer characteristic is dramatically curved downward (convex) at 15 deg where m=−0.12 deg/deg.

Although the research was performed at RF it is reasonable to assume that the relationship between boresight error slope and transfer characteristic nonlinearity is not frequency dependent. Accordingly the physical principle of this invention applies to infra-red (IR) as well as RF seekers. However, only the boresight error slope of an RF seeker with a gimballed phase monopulse antenna or a phase interferometer will be described.

If the antenna beam is caused to dither intermittently at a rate too great for the tracking loop to respond, then the seeker tracking loop is open insofar as the dither is concerned. However the normal tracking loop is left unperturbed. The real time sensed seeker output voltage vs. look angle TCR can then be determined, without interfering with normal tracking.

There are three properties of the transfer characteristic which are pertinent to this patent. First the transfer characteristic (TC) may be a straight line with any slope (not to be confused with boresight error slope) but with the null shifted away from antenna array normal. The amount the electrical null is shifted from array normal is the boresight error and can not be sensed by the device described herein. Second the slope of the TC is a measure of tracking loop gain and is sensed in this device. Third, the nonlinearity of the TC in the neighborhood of the LOS is a measure of the boresight error slope. This is also sensed by this device and is the key to this invention. The magnitude and sense of the boresight error slope are proportional to the magnitude and sense respectively of the transfer characteristic nonlinearity in the neighborhood of the line of sight.

5.0 FUNCTIONAL DESCRIPTION

Two identical channels (pitch and yaw) are required. Only the pitch channel will be described.

5.1 Beam Dither Generator

Refer to FIG. 2. A pulsed sawtooth dither waveform generator 4 generates a sawtooth voltage waveform $V_D(t)$ with the following parameters:

(a)	Duty Factor:	$\overline{DF} = 0.1$
(b)	Pulse repetition frequency:	$PRF = 100$ pps
(c)	Pulse duration:	$\tau = 1$ ms.
(c)	Sawtooth frequency	$f_C = 10$ KHz
(f)	Pulse repetition interval	$T = \frac{1}{PRF} = 0.01$ sec

Values of the foregoing parameters can be justified for the following reasons:

a. Duty Factor: A dither duty factor ($\overline{DF}$) no greater than about 10% is required so that no perturbation exists for approximately 90% of the time, thus leaving the normal tracking loop virtually unperturbed.

b. PRF: A PRF much greater than the normal tracking loop bandwidth, typically 5 to 10 Hz, is required, again so that the normal tracking loop cannot respond to the perturbations. Thus, a dither PRF=100 pps appears reasonable.

c. Pulsewidth: The pulsewidth from items a and b is

$$\tau = \frac{\overline{DF}}{PRF} = 10 \text{ ms.}$$

d. Carrier Frequency: Approximately 10 cycles are desired in order to yield good average values when the result is averaged over one pulsewidth. Thus, a dither carrier frequency of

$$f_c = \frac{N}{\tau} = \frac{10}{1 \times 10^{-3}} = 10 \text{ KHz}$$

appears reasonable.

e Amplitude: The peak value of the waveform is chosen to shift the beam±0.5 beamwidths about the nominal electrical boresight axis.

The output voltage $V_D(t)$ from the dither waveform generator (4) is coupled to an adder 6 via a shielded conductor 5. This voltage is added to V_m which is coupled to the adder 6 on a shielded conductor 7 from the boresight error slope computer 27, described later. The sum $V_S(t)$ is applied to the dither phase shifter 9 via a shielded conductor 8. The dither phase shifter 9 can be either an analog phase shifter (ferrite) or digital (PIN diodes). An analog phase shifter is used here. The dither phase shifter 9 is in one arm B of a phase monopulse antenna 10. RF is fed from subarray B of antenna 10 to the dither phase shifter 9 via waveguide 11. The output of the dither phase shifter 9 is coupled to the magic T 13 via waveguide 12. RF from subarray A of antenna 10 is fed to the magic T 13 on waveguide 14.

The magic T 13 forms the complex sum, (Σ), and complex difference, (Δ), of the two RF voltages on waveguide 12 and 14. These are fed to the Σ and Δ mixers (not shown) on waveguides 15 and 16 respectively where they are converted to ΣIF and ΔIF, respectively.

The antenna beam center 17 is caused to dither with respect to array normal 18 in accordance with the sawtooth waveform $V_D(t)$.

It is inertialess scanning and can be as rapid as we please, even 10,000 times per second (f_c=10 KHz).

5.2 Boresight Error Slope Sensor

The boresight error slope sensor is implemented as two feedback loops. The first is the boresight error slope correction loop. It is a phase correction loop with the dither phase shifter 9 (FIG. 2) as the follow-up device since the antenna is a phase monopulse antenna. If the seeker were an IR

sensor, the boresight error slope correction could be implemented with an open loop computation. The second loop is an AGC (automatic gain control) loop to correct for scale factor error.

Refer to FIG. 3. The boresight error slope sensor requires two inputs from the seeker receiver. The first is the antenna servo output usually low-pass filtered to about 10 Hz. This is denoted by ε(t) and is a voltage proportional to the angle of the LOS from electrical boresight. It is sometimes called the dynamic lag. ε(t) is coupled to the boresight error slope sensor on a shielded conductor 19. The second input is the video from the ratio detector which forms the ratio Re

$$\left[\frac{\Delta}{\Sigma}\right].$$

The video is usually pulses for a pulsed radar, although other types of wide bandwidth signals such as those received from passive IR or cw jammers, may be accepted. This wide band video is coupled to the boresight error slope sensor via coax cable 20.

(a) Boresight Error Slope Correction Loop

If the LOS is at electrical boresight the receiver difference channel IF, (i.e. ΔIF) is zero and the voltage on coax 20 is zero. If the LOS is within the Σ beamwidth (i.e. FOV) but not at boresight the ratio detector output on coax 20 is proportional to the LOS angle off boresight. This differs from ε(t) on 19 in that ε(t) is low pass filtered to about 10 Hz whereas Re

$$\left[\frac{\Delta}{\Sigma}\right]$$

on 20 is wide band video (of the order of a few MHz).

The received video on coax 20 and the dynamic lag ε(t) on shielded cable 19 are processed in a signal processor comprised of the sample-and-hold circuit 21 and a coincidence detector 22. For a pulsed radar there must be at least one sample per pulse. Alternatively, the sampling rate (Nyguist Sampling Theorem) must be at least twice the information bandwidth, or two samples per cycle of information. This sample is held for the received pulse repetition interval. The sample rate and the hold period are set by the associated radar parameters. With the sample rate and the hold duration properly chosen and the beam dithering, the output voltage on conductor 23 is a time varying voltage denoted by $V_{DR}(t)$, the instantaneous value of which is proportional to the angle between the Δ pattern beam null and the LOS. $V_{DR}(t)$ is compared in the coincidence detector 22 with the lag voltage Kε(t) on conductor 24. K is the gain of the AGC amplifier 25. At the instant $V_{DR}(t)$=K ε(t) the output of the coincidence detector on conductor 26 is a delta function or unit impulse δ(LOS). The time of occurance of δ(LOS) is the time the signal $V_{DR}(t)$ received as a result of the rapid antenna beam dither (open loop) equals the low pass filtered voltage Kε(t) of the tracking loop (closed loop).

The unit impulse δ(LOS) on conductor 26 is fed to the boresight error slope computer 27 along with the voltage $V_{DR}(t)$ on conductor 23 from the sample-and-hold 21. Recall that $V_{DR}(t)$ is the rapidly time varying received voltage resulting from antenna dither. This voltage $V_{DR}(t)$ is sampled in the boresight error slope computer 27 by the unit impulse δ(LOS) to yield a voltage V_{DR}(LOS). This is the value of the voltage $V_{DR}(t)$ at the instant the antenna beam or field-of-view is at the position it would be if the beam were not dithering and the tracking loop were closed. In other words the value of the transfer characteristic at the LOS has been obtained, and without disturbing the tracking loop.

Now the value of the transfer characteristic a small angle either side of LOS is desired. This is obtained from a unit impulse occuring at LOS±Δt from the clock in the dither waveform generator 4 and coupled to the boresight error slope computer 27 via conductor 28. Note that the unit impulse δ(LOS) on conductor 26 is also fed to the dither waveform generator 4. Thus a small increment of time Δt is added to or subtracted from the time of occurance of δ(LOS) to yield δ(LOSγΔθ). This holds since the dither waveform is a sawtooth, hence the angular excursions of the antenna beam or field of-view are linear functions of time. Therefore a voltage V_{DR}(LOS±Δθ) is generated by sampling V_{DR}(t) with the delta function δ(LOS±Δθ). In other words the value of the transfer characteristic at LOS±Δθ in the neighborhood of the line of sight has been obtained. A boresight error slope correction voltage V_m is now formed in the boresight error slope computer 27 from the relation

$$V_m[V_{DR}(LOS+\Delta\theta)-V_{DR}(LOS)]-[V_{DR}(LOS)-V_{DR}(LOS\Delta\theta)]$$

Notice that if the transfer characteristic is a straight line, the two terms in brackets are equal and V_m=0. Thus this "second difference" method yields a correction voltage V_m proportional to the nonlinearity of the transfer characteristic. And this was shown in FIG. 1 and Section 4.0 to be proportional to the boresight error slope. V_m is fed to the adder 6, FIG. 2, via shielded cable 7. A voltage proportional to body rate $\dot{\theta}$ is fed to the boresight error slope computer 27 on shielded cable 29 to determine the sense of V_m. The boresight error slope correction loop is now complete.

(b) AGC Loop (Scale Factor Correction Loop)

An automatic gain control (AGC) or scale factor correction voltage is generated in the AGC computer 30 in much the same manner as the boresight error slope correction voltage V_m was generated.

The voltage V_{DR}(t), the instantaneous value of which is proportional to the angle of the Δ null from LOS, is fed to the AGC computer 30 from the sample-and-hold 21 via conductor 23. Also fed to the AGC computer 30 is the unit impulse δ(LOS) from the coincidence detector 22 via conductor 26. δ(LOS) samples V_{DR}(t) to form a voltage V_{DR} (LOS) just as was done in the boresight error slope computer. Now the value of the transfer characteristic a small angle either side of LOS V_{DR}(LOS±Δθ) is also generated in the AGC computer 30 by sampling V_{DR}(t) by a delta function δ(LOSγΔθ) fed to the AGC computer 30 from the dither waveform generator 4 via conductor 31 just as was done in the boresight error slope computer. In fact the voltage V_{DR}(LOS) and V_{DR}(LOS±Δθ) generated in the boresight error slope computer 27 could be used in the AGC computer 30.

Here the similarity ends. The AGC loop depends upon the difference between the voltages from the actual received transfer characteristic TCR and the corresponding voltages from the ideal transfer characteristic TCA. Since the dither driving function is a sawtooth, the instantaneous angle of the antenna A pattern from the array normal is linearly proportional to the dither voltage V_D(t). Accordingly the dither voltage V_D(t), coupled to the AGC computer via conductor 32, is sampled by δ(LOS) and δ(LOSγΔθ) to yield V_D(LOS) and V_D(LOSγΔθ) respectively from the ideal transfer characteristic. An AGC correction voltage V_{AGC} is then generated from the relation.

$$V_{AGC}[V_{DR}(LOS+\Delta\theta)-V_{DR}(LOS)]-[V_D(LOS\pm\Delta\theta)-V_D(LOS)]$$

If the two voltages in brackes are equal, the AGC voltage is zero and the open loop transfer characteristic TCR coincides with the ideal transfer characteristic TCA. The AGC voltage V_{AGC} is applied to the AGC amplifier 25 via conductor 33 to control the gain of the AGC amplifier 25, thereby yielding a better estimate of ε(t) on conductor 24 than would otherwise be available. The output of the AGC amplifier 25 is fed to the autopilot via conductor 34.

6.0 CONCLUSION

It is concluded that the REAL TIME BORESIGHT ERROR SLOPE SENSOR described herein can sense and reduce the boresight error slope in real time from whatever the cause of nonzero slope. These include high temperature gradients from aerodynamic heating, frequency agility, ablation, plasma, char, erosion, and irradiation by a high energy laser.

Since the boresight error slope is sensed by measuring the curvature of the seeker open loop transfer characteristic, the technique is independent of carrier frequency. Accordingly this patent applies to infra-red (IR) seekers as well as radio frequency (RF) seekers.

GLOSSARY (U)

LOS Line of sight
m boresight error slope
$\dot{\theta}$ body rate
$\Delta\dot{\theta}$ error in line-of-sight rate
RF Radio frequency
IR Infra-red
TC Transfer characteristic (seeker output voltage vs look angle relative to electrical null
TCR Received transfer characteristic
TCI Ideal transfer characteristic
DF Duty factor
PRF Pulse repetition frequency
T Pulse duration
f_c Sawtooth frequency
T Pulse repetition interval

$$T=\frac{1}{PRF}$$

N Number of cycles f_c during τ, ($N=f_c\tau$)
V_D(t) Voltage output of dither waveform generator
V_m Voltage output of m computer
$V_S(t)$ $V_D(t)+V_m$
ε(t) Antenna servo dynamic lag
RE

$$\left[\frac{\Delta}{\Sigma}\right]$$

Ratio detector output
Σ Antenna sum pattern or sum voltage
Δ Antenna difference pattern or Δ voltage
V_{DR}(t) Voltage output of sample and hold
δ(χ) Unit impulse occuring at χ
t running time
Δt small increment in time

V_{m} Voltage proportional to boresight error slope

V_{AGC} Voltage proportional to difference in slope of ideal transfer characteristic and measured transfer characteristic

I claim:

1. A boresight error slope reduction system for sensing, in real time, a boresight error slope in a homing seeker, said system comprising:

(a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(b) a receiver wherein a wide bandwidth video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(c) a tracking loop having a means for using said signal voltage to steer said field-of-view so that said object remains within said field-of view and a means for generating a low-pass filtered dynamic lag voltage from said video signal voltage, and

(d) a dither waveform generator wherein a dither voltage is generated and

(e) a means for using said dither voltage to cause a dither of said boresight axis and

(f) a means for causing said tracking loop to be open during said dither of said boresight axis and

(g) a boresight error slope computer circuit for generating a transfer characteristic having a measurable curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(i) an additive means for using said correction voltage to reduce said boresight error slope.

2. The boresight error slope reduction system of claim 1 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

(a) a transfer characteristic sample-and-hold circuit for obtaining two samples of said transfer characteristic, a first sample being obtained at a first instant, said first instant being the instant of coincidence between said wide bandwidth video signal voltage and said low-pass filtered dynamic lag voltage, and a second sample being obtained at a second instant, said second instant being at a different time from said first instant, and

(b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

(f) a means for applying said automatic gain control voltage to said automatic gain control amplifier.

3. The boresight error slope reduction system of claim 1 wherein said seeker is a radio frequency seeker having a phase sensing monopulse antenna and said additive means is a phase shifter.

4. The boresight error slope reduction system of claim 1 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

* * * * *

ENCLOSURE 2

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Patent Application

Of

Alton B. Hornback

REAL TIME BORESIGHT ERROR SLOPE SENSOR ~~(U)~~

1.0 BACKGROUND ~~(U)~~

1.1 Field of the Invention ~~(U)~~

~~(U)~~ This invention is in the field of missile guidance and relates to a device which senses, in real time, the boresight error slope.

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~~MCDONNELL DOUGLAS ASTRONAUTICS COMPANY~~				~~HUNTINGTON BEACH, CA.~~	
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1.2 The Prior Art ~~(U)~~

~~(U)~~ In a missile which employs a terminal homing seeker and a proportional navigation guidance law, the space rate of change of boresight error, i. e., the boresight error slope, is one of the predominant error sources. This slope is defined as a small change in boresight error divided by a small change in aspect angle. With a proportional navigation guidance law, of ~~all that~~ is required ~~to hit the target is~~ that the line-of-sight (LOS) to the target not rotate in inertial space. Thus an error in line-of-sight rate rather than an error in LOS angle, per se, is the predominamt error. When the boresight error slope (denoted by m) is multiplied by body rate (denoted by $\dot{\theta}$) an error in LOS rate (denoted by $\Delta\dot{\beta}$) is produced. Since $\Delta\dot{\beta}$ is in a parasitic loop from body rate to apparent target motion, through the guidance gain, and back to body rate it can cause erratic instabilities.

U ~~(C)~~ Various approaches have been used to minimize either the boresight error slope or its effect on missile guidance. These include:

a. ~~(U)~~ Reducing guidance loop gain or increasing guidance time constant. This compromises guidance accuracy.

b. ~~(U)~~ Controlling radome wall thickness during the fabrication process by machine grinding or forming. This is expensive, time consuming, and usually yields a boresight error slope greater than about 0.06 degrees per degree.

c. ~~(U)~~ Preflight mapping the boresight errors, storing these errors in a look-up table and actively compensating for the errors during flight. Although residual errors after compensation have been measured as low as 0.01 deg/deg this is very expensive since each radome must be individually mapped. Also, this does not compensate for inflight variation of errors.

d. U ~~(C)~~ Opening the guidance loop and introducing a known dither, in both pitch and yaw, of the body axis about the velocity vector while the seeker is still tracking the target. The measured LOS ~~boresight~~ rate ~~angle~~ is then compared with that expected from the known dither rate ~~attitude~~ to obtain the LOS rate ~~boresight~~ error. This technique may introduce

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~~(C)~~ U oscillation into an otherwise marginally stable missile. It takes considerable time and energy because of the two-axis dither. The dither is necessarily slow because of missile response time; therefore the data may not be in real time for hypersonic flight where the radome statistics are changing rapidly. This method has never been tested, ~~although it was proposed for the HEDI (high endoatmospheric interceptor) for the SDI (strategic defense initiative) program.~~

~~(U)~~ It has been found that for supersonic flight at high altitude with low aerodynamic q, a boresight error slope (m) < 0.01 deg/deg is required to prevent the parasitic loop from causing the missile to go unstable. Thus the foregoing approaches to reducing m may not be satisfactory.

2.0 OBJECTS AND ADVANTAGES ~~(U)~~

~~(U)~~ The real time boresight error slope sensor described herein is an inexpensive device capable of reducing the line-of-sight rate errors contributed by the radome or IR dome in real time from whatever the cause. The various sources of nonzero m include those ~~arizing~~ arising from aerodynamic heating from supersonic or hypersonic flight such as ablation, plasma, char and erosion, as well as those from external sources such as frequency agility or irradation by a high energy laser. This is accomplished in real time which is necessary if the dome statistics are time varying.

3.0 DRAWING FIGURES ~~(U)~~

~~(U)~~ Figure 1 shows the nonlinearity of three characteristic curves for three different look angles.

~~(U)~~ Figure 2 is a functional block diagram of the antenna beam dither generator.

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~~(U)~~ Figure 3 is a functional block diagram of the boresight error slope sensor with a scale factor (AGC) correction loop.

4.0 PHYSICAL PRINCIPLE ~~(U)~~

~~(S)~~ During a research program to employ a microwave RF (radio frequency) seeker in a hypersonic missile, this inventor discovered that the curvature of the seeker open loop transfer characteristic (i.e. output voltage vs. look angle measured from electrical boresight) was proportional to the boresight error slope. The pertinent results of this research are shown in Figure 1. Curve 1 shows that the transfer characteristic is slightly curved upward (concave) at a look angle of 1 deg off the nose where the boresight error slope m, was found to be +0.05 deg/deg. Curve 2 shows that the transfer characteristic is a straight line at an LOS = 7 deg where m = 0. Curve 3 shows that the transfer characteristic is dramatically curved downward (convex) at 15 deg where m = -0.12 deg/deg.

~~(C)~~ Although the research was performed at RF it is reasonable to assume that the relationship between boresight error slope and transfer characteristic nonlinearity is not frequency dependent. Accordingly the physical principle of this invention applies to infra-red (IR) as well as RF seekers. However, only the boresight error slope of an RF seeker with a gimballed phase monopulse antenna or a phase interferometer will be described.

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~~(C)~~ electrical null is shifted from array normal is the boresight error and can not be sensed by the device described herein. Second the slope of the TC is a measure of tracking loop gain and is sensed in this device. Third, the nonlinearity of the TC in the neighborhood of the LOS is a measure of the boresight error slope. This is also sensed by this device and is the key to this invention. The magnitude and sense of the boresight error slope are proportional to the magnitude and sense respectively of the transfer characteristic nonlinearity in the neighborhood of the line-of-sight.

5.0 FUNCTIONAL DESCRIPTION ~~(U)~~

~~(U)~~ Two identical channels (pitch and yaw) are required. Only the pitch channel will be described.

5.1 Beam Dither Generator ~~(U)~~

~~(U)~~ Refer to Figure 2. A pulsed sawtooth dither waveform generator 4 generates a sawtooth voltage waveform $V_D(t)$ with the following parameters:

(a)	~~(U)~~	Duty Factor:	$\overline{DF} = 0.1$
(b)	~~(U)~~	Pulse repetition frequency:	PRF = 100 pps
(c)	~~(U)~~	Pulse duration:	$\tau = 1$ ms.
(d)	~~(U)~~	Sawtooth frequency:	$f_c = 10$ KHz
(e)	~~(U)~~	Pulse repetition interval	$T = \frac{1}{PRF} = 0.01$ sec

~~(U)~~ Values of the foregoing parameters can be justified for the following reasons:

a. ~~(U)~~ Duty Factor: A dither duty factor ($\overline{DF}$) no greater than about 10% is required so that no perturbation exists for approximately 90% of the time, thus leaving the normal tracking loop virtually unperturbed.

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b. ~~(U)~~ PRF: A PRF much greater than the normal tracking loop bandwidth, typically 5 to 10 Hz, is required, again so that the normal tracking loop cannot respond to the perturbations. Thus, a dither PRF = 100 pps appears reasonable.

c. ~~(U)~~ Pulsewidth: The pulsewidth from items ~~A and B~~ [a and b] is $\tau = \frac{DF}{PRF} = 1.0$ ms.

d. ~~(U)~~ Carrier Frequency: Approximately 10 cycles ~~is~~ [are] desired in order to yield good average values when the result is averaged over one pulsewidth. Thus, a dither carrier frequency of

$$f_c = \frac{N}{\tau} = \frac{10}{1 \times 10^{-3}} = 10 \text{ KHz}$$

appears reasonable.

e ~~(U)~~ Amplitude: The peak value of the waveform is chosen to shift the beam ±0.5 beamwidths about the nominal electrical boresight axis.

~~(U)~~ The output voltage $V_D(t)$ from the dither waveform generator (4) is coupled to an adder 6 via a shielded conductor 5. This voltage is added to V_m which is coupled to the adder 6 on a shielded conductor 7 from the boresight error slope computer 27, described later. The sum $V_S(t)$ is applied to the dither phase shifter 9 via a shielded conductor 8. The dither phase shifter 9 can be either an analog phase shifter (ferrite) or digital (PIN diodes). An analog phase shifter is used here. The dither phase shifter 9 is in one arm B of a phase monopulse antenna 10. RF is fed from subarray B of antenna 10 to the dither phase shifter 9 via waveguide 11. The output of the dither phase shifter 9 is coupled to the magic T 13 via waveguide 12. RF from subarray A of antenna 10 is fed to the magic T 13 on ~~wave guide~~ [waveguide] 14.

~~(U)~~ The magic T 13 forms the complex sum, (Σ), and complex difference, (Δ), of the two RF voltages on waveguides 12 and 14. These are fed to the Σ and Δ mixers (not shown) on waveguides 15 and 16 respectively where they are converted to ΣIF and ΔIF, respectively.

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~~(C)~~ U The antenna beam center 17 is caused to dither with respect to array normal 18 in accordance with the sawtooth waveform $V_D(t)$.

It is inertialess scanning and can be as rapid as we please, even 10,000 times per second (f_c = 10 KHz).

5.2 Boresight Error Slope Sensor ~~(U)~~

~~(U)~~ The boresight error slope sensor is implemented as two feedback loops. The first is the boresight error slope correction loop. It is a phase correction loop with the dither phase shifter 9 (figure 2) as the follow-up device since the antenna is a phase monopulse antenna. If the seeker were an IR sensor, the boresight error slope correction could be implemented with an open loop computation. The second loop is an AGC (automatic gain control) loop to correct for scale factor error.

~~(U)~~ Refer to figure 3. The boresight error slope sensor requires two inputs from the seeker receiver. The first is the antenna servo output usually low-pass filtered to about 10 Hz. This is denoted by $\varepsilon(t)$ and is a voltage proportional to the angle of the LOS from electrical boresight. It is sometimes called the dynamic lag. $\varepsilon(t)$ is coupled to the boresight error slope sensor on a shielded conductor 19. The second input is the video from the ratio detector which forms the ratio $Re\left[\frac{\Delta}{\Sigma}\right]$. The video is usually pulses for a pulsed radar, although other types of wide bandwidth signals such as those received from passive IR or cw jammers, may be accepted. This wide band video is coupled to the boresight error slope sensor via coax cable 20.

(a) Boresight Error Slope Correction Loop ~~(U)~~

~~(U)~~ If the LOS is at electrical boresight the receiver difference channel IF, (i.e. ΔIF) is zero and the voltage on coax 20 is zero. If the LOS is within the Σ beamwidth (i.e. FOV) but not at boresight the ratio detector

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~~(U)~~ output on coax 20 is proportional to the LOS angle off boresight. This differs from $\varepsilon(t)$ on 19 in that $\varepsilon(t)$ is low pass filtered to about 10 Hz whereas $Re\left[\left[\frac{\Delta}{\Sigma}\right]\right]$ on 20 is wide band video (of the order of a few MHz).

~~(U)~~ The received video on coax 20 and the dynamic lag $\varepsilon(t)$ on shielded cable 19 are processed in a signal processor comprised of the sample-and-hold circuit 21 and a coincidence detector 22. For a pulsed radar there must be at least one sample per pulse. Alternatively, the sampling rate (Nyguist Sampling Theorem) must be at least twice the information bandwidth, or two samples per cycle of information. This sample is held for the received pulse repetition interval. The sample rate and the hold period are set by the associated radar parameters. With the sample rate and the hold duration properly chosen and the beam dithering, the output voltage on conductor 23 is a time varying voltage denoted by $V_{DR}(t)$, the instantaneous value of which is proportional to the angle between the Δ pattern beam null and the LOS. $V_{DR}(t)$ is compared in the coincidence detector 22 with the lag voltage $K\varepsilon(t)$ on conductor 24. K is the gain of the AGC amplifier 25. At the instant $V_{DR}(t) = K\,\varepsilon(t)$ the output of the coincidence detector on conductor 26 is a delta function or unit impulse δ(LOS). The time of occurance of δ(LOS) is the time the signal $V_{DR}(t)$ received as a result of the rapid antenna beam dither (open loop) equals the low pass filtered voltage $K\varepsilon(t)$ of the tracking loop (closed loop).

~~(U)~~ The unit impulse δ(LOS) on conductor 26 is fed to the boresight error slope computer 27 along with the voltage $V_{DR}(t)$ on conductor 23 from the sample-and-hold 21. Recall that $V_{DR}(t)$ is the rapidly time varying received voltage resulting from antenna dither. This voltage $V_{DR}(t)$ is sampled in the boresight error slope computer 27 by the unit impulse δ(LOS) to yield a voltage V_{DR}(LOS). This is the value of the voltage $V_{DR}(t)$ at the instant the antenna beam or field-of-view is at the position it would be if the beam were not dithering and the tracking loop were closed. In other words the value of the transfer characteristic at the LOS has been obtained, and without disturbing the tracking loop.

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~~(C)~~ 30 from the sample-and-hold 21 via conductor 23. Also fed to the AGC computer 30 is the unit impulse δ(LOS) from the coincidence detector 22 via conductor 26. δ(LOS) samples $V_{DR}(t)$ to form a voltage V_{DR}(LOS) just as was done in the boresight error slope computer. Now the value of the transfer characteristic a small angle either side of LOS $V_{DR}(LOS \pm \Delta\theta)$ is also generated in the AGC computer 30 by sampling $V_{DR}(t)$ by a delta function $\delta(LOS \pm \Delta\theta)$ fed to the AGC computer 30 from the dither waveform generator 4 via conductor 31 just as was done in the boresight error slope computer. In fact the voltage V_{DR}(LOS) and $V_{DR}(LOS \pm \Delta\theta)$ generated in the boresight error slope computer 27 could be used in the AGC computer 30.

~~(C)~~ Here the similarity ends. The AGC loop depends upon the difference between the voltages from the actual received transfer characteristic TCR and the corresponding voltages from the ideal transfer characteristic TCA. Since the dither driving function is a sawtooth, the instantaneous angle of the antenna Δ pattern from the array normal is linearly proportional to the dither voltage $V_D(t)$. Accordingly the dither voltage $V_D(t)$, coupled to the AGC computer via conductor 32, is sampled by δ(LOS) and $\delta(LOS \pm \Delta\theta)$ to yield V_D(LOS) and $V_D(LOS \pm \Delta\theta)$ respectively from the ideal transfer characteristic. An AGC correction voltage V_{AGC} is then generated from the relation.

$$V_{AGC} = \left[V_{DR}\ (LOS \pm \Delta\theta) - V_{DR}\ (LOS)\right] - \left[V_D\ (LOS \pm \Delta\theta) - V_D\ (LOS)\right]$$

If the two voltages in brackes are equal, the AGC voltage is zero and the open loop transfer characteristic TCR coincides with the ideal transfer characteristic TCA. The AGC voltage V_{AGC} is applied to the AGC amplifier 25 via conductor 33 to control the gain of the AGC amplifier 25, thereby yielding a better estimate of $\varepsilon(t)$ on conductor 24 than would otherwise be available. The output of the AGC amplifier 25 is fed to the autopilot via conductor 34.

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6.0 CONCLUSION ~~(U)~~

~~(U)~~ It is concluded that the REAL TIME BORESIGHT ERROR SLOPE SENSOR described herein can sense and reduce the boresight error slope in real time from whatever the cause of nonzero slope. These include high temperature gradients from aerodynamic heating, frequency agility, ablation, plasma, char, erosion, and irradiation by a high energy laser.

~~(C)~~ Since the boresight error slope is sensed by measuring the curvature of the seeker open loop transfer characteristic, the technique is independent of carrier frequency. Accordingly this patent applies to infra-red (IR) seekers as well as radio frequency (RF) seekers.

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Claims: I claim: ~~(U)~~

~~(C)~~ 1. Electronic circuits comprising:

a. (U) a waveform generator and
b. (U) an additive means to use output of said waveform generator to cause a dither of the seeker instantaneous field-of-view about the electrical boresight axis and
c. (U) a receiver to receive the time varying signal resulting from said dither and
d. (U) a signal processor to generate a seeker transfer characteristic from said time varying signal and
e. (C) a computer to generate a voltage proportional to the curvature of said transfer characteristic and
f. (C) an additive means to use said voltage to reduce the boresight error slope.

~~(U)~~ 2. The invention of claim 1, further including an automatic gain control loop comprising:.

a. (U) an AGC computer to generate an AGC voltage proportional to the deviation of the transfer characteristic of claim 1 from the ideal transfer characteristic and
b. (U) an additive means to use said AGC voltage to control the gain of the normal tracking loop.

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add a²

add a³

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GLOSSARY (U)

~~(u)~~	LOS	Line of sight
~~(u)~~	m	boresight error slope
~~(u)~~	$\dot{\theta}$	body rate
~~(u)~~	$\Delta\dot{\beta}$	error in line-of-sight rate
~~(u)~~	RF	Radio frequency
~~(u)~~	IR	Infra-red
~~(u)~~	TC	Transfer characteristic (seeker output voltage vs look angle relative to electrical null
~~(u)~~	TCR	Received transfer characteristic
	TCI	Ideal transfer characteristic
~~(u)~~	DF	Duty factor
~~(u)~~	PRF	Pulse repetition frequency
~~(u)~~	τ	Pulse duration
~~(u)~~	f_c	Sawtooth frequency
0140 ~~(u)~~	T	Pulse repetition interval $T = \frac{1}{PRF}$
~~(u)~~	N	Number of cycles f_c during τ, $(N = f_c\tau)$
~~(u)~~	$V_D(t)$	Voltage output of dither waveform generator
~~(u)~~	V_m	Voltage output of m computer
~~(u)~~	$V_S(t)$	$V_D(t) + V_m$
~~(u)~~	$\varepsilon(t)$	Antenna servo dynamic lag
0141 ~~(u)~~	$RE\left[\frac{\Delta}{\Sigma}\right]$	Ratio detector output
~~(u)~~	Σ	Antenna sum pattern or sum voltage
~~(u)~~	Δ	Antenna difference pattern or Δ voltage
~~(u)~~	$V_{DR}(t)$	Voltage output of sample and hold
~~(u)~~	$\delta(x)$	Unit impulse occuring at x
~~(u)~~	t	running time
~~(u)~~	Δt	small increment in time
~~(u)~~	V_m	Voltage proportional to boresight error slope
~~(u)~~	VAGC	Voltage proportional to difference in slope of ideal transfer characteristic and measured transfer characteristic
~~(u)~~		

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REAL TIME BORESIGHT ERROR SLOPE SENSOR ~~(U)~~

ABSTRACT ~~(U)~~ The Disclosure

~~(U)~~ In a missile which employs a terminal homing seeker and a proportional navigation guidance law the space rate of change of boresight error, i.e., the boresight error slope, is one of the predominant error sources.

~~(S)~~ It has been found that the boresight error slope is proportional to the curvature of the seeker open loop transfer characteristic. Accordingly, the boresight error slope sensor senses the curvature of the seeker open loop transfer characteristic. This is accomplished by intermittently dithering the seeker instantaneous field-of-view about the line of sight at a rate too great for the normal tracking loop to respond. Thus the open loop transfer characteristic is obtained while leaving the normal tracking loop unperturbed. The curvature of the open loop transfer characteristic is then obtained in real time by computing the "second differences" from the measured open loop transfer characteristic.

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In the United States Patent and Trademark Office

ENCLOSURE 3

Serial Nr.: 06/859,033

Filed: 04/25/1986

Inventor(s): ALTON B. HORNBACK

Title: REAL TIME BORESIGHT ERROR SLOPE SENSOR (u)

Examiner and G.A.U.: CHARLES T. JORDAN/GAU 221

RECEIVED MAY 11 1987 GROUP 220 LICENSING & REVIE[W]

SUPPLEMENTAL **Amendment** A

CLASSIFIED ANNEX

Date: 6 MAY 1987

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

Alton B. Hornback
ALTON B. HORNBACK, APPLICANT

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

Agency and office or origin:
Air Force Armament Laboratory/DLM (AD)
Eglin AFB FL 32542

Contract No. IRAD 111182	☐ Review For Declassification	☐ Declassify On 15 OCT 99	
Classified by AFAL/DLM (AD) EGLIN AFB	☐ Downgrade To	On	

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CLASSIFIED ANNEX

Date: 6 ... 1987

GROUP 220
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Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

Alton B. Hornback
ALTON B. HORNBACK, APPLICANT

Original classification authority:
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Contract No. IRAD 111182	☐ Review For Declassification	☐ Declassify On 15 OCT 99	
Classified by AFAL/DLM (AD) EGLIN AFB	☐ Downgrade To	On	

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(U) Claims:

(U) Claim 1, cancel and rewrite as new claim 3 as follows:

(C) 3. A boresight error slope reduction system for sensing, in real time, a boresight error slope in a homing seeker, said system comprising:

(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker thereby causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said video signal voltage to generate a filtered dynammc lag voltage, said dynamic lag voltage being used to steer said field-of-view so that said object remains within said field-of-view, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker thereby causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said video signal voltage to generate a filtered dynammc lag voltage, said dynamic lag voltage being used to steer said field-of-view so that said object remains within said field-of-view, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (e) a means for using said dither voltage to cause a dither of said boresight axis and

(U) (f) a means for causing said tracking loop to be open during said dither of said boresight axis and

(U) (g) a boresight error slope computer circuit for generating a transfer characteristic having a measurable curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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tran characteristic having a me ble curvature, said trans characteristic being a volta functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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(U) (a) a transfer characteristic sample-and-hold circuit for obtaining two samples of said transfer characteristic, a first sample being obtained at a first instant, said first instant being the instant of coincidence between said video signal voltage and said filtered dynamic lag voltage, and a second sample being obtained at a second instant, said second instant being at a different time from said first instant, and

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

secon[illegible] nt being at a different [illegible] from said first instant [illegible]d

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

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PAGE 4a

(U) (f) a means for applying said automatic gain control voltage to said automatic gain control amplifier.

(U) Please add two new claims as follows:

(U) 5. The boresight error slope reduction system of claim 3 wherein said seeker is a radio frequency seeker having a phase sensing monopulse antenna and said additive means is a phase shifter.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

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ENCLOSURE 4

UNITED S . .TES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
		HORNBACK	

ALTON B. HORNBACK
5450 BLOCH STREET
SAN DIEGO, CA 92122

EXAMINER	
ART UNIT	PAPER NUMBER
	7

DATE MAILED:

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on 5/4/87 & 5/11/87 ☐ This action is made final.

~~A shortened~~ statutory period for response to this action is set to expire 6 month(s), ______ ~~days from~~ the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449
4. ☐ Notice of informal Patent Application, Form PTO-152
5. ☐ Information on How to Effect Drawing Changes, PTO-1474
6. ☐ ______

Part II SUMMARY OF ACTION

1. ☒ Claims 3-6 are pending in the application.

   Of the above, claims ______ are withdrawn from consideration.

2. ☒ Claims 1 and 2 have been cancelled.
3. ☒ Claims 3-6 are allowed.
4. ☐ Claims ______ are rejected.
5. ☐ Claims ______ are objected to.
6. ☐ Claims ______ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.
8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on ______. These drawings are ☐ acceptable; ☐ not acceptable (see explanation).
10. ☐ The ☐ proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on ______. has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed ______, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections MUST be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.
12. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. ______; filed on ______.
13. ☒ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

(u) 1. This application is in condition for allowance except for the following formal matter:

Except for the presence of papers with security classification markings thereon this case is otherwise in condition for allowance.

Accordingly, applicant is required within the statutory period for response to either (1) effect removal of the security classification markings, or (2) request the agency responsible therefore to impose a Secrecy Order.

Prosecution on the merits is closed in accordance with the practice under ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.

A STATUTORY PERIOD FOR RESPONSE TO THIS ACTION IS SET TO EXPIRE SIX MONTHS FROM THE DATE OF THIS LETTER.

(u) 2. Any inquiry concerning this communication should be directed to Charles T. Jordan at telephone number 703-557-4911.

Charles T. Jordan/rg-5

05-27-87

CHARLES T. JORDAN
EXAMINER
GROUP ART UNIT 221

ENCLOSURE 5

ALTON B. HORNBACK
MARY R. HORNBACK
5650 BLOCH STREET (858) 453-3334
SAN DIEGO, CA 92122

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Date Aug. 2, 2007

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ENCLOSURE 5

INITIAL SCREENING OF INCOMING PAPERS CHECKLIST

Reviewer: CB Date: 8-6-07

APPLICATION NO. 6079666 06/859033

9/10/07 DENIST

1. PETITION TYPE	CODE	PETITION TYPE	CODE
____R137(a) Petition	501	____R28c Petition (small to large)	321
____R137(a) Petition (Issue Fee/Dwgs)	509	____R28c Petition (large to small)	320
____R137(b) Petition	502	____R47 Petition	313
____R137(b) Petition (IFEE/DWG)	510	____R53 Petition(Lost App., postcard rec., inc. by ref., conversions, misnum/mislabel. dwgs	408
____R53(e) Filing Date	412	____R10(d) Exp. Mail FD (USPS)	411
____R137(f) Petition	536	____R10(c/e) Exp. Mail FD	416
____R183 Pet. (waive R67 sup. dec.)	516	____R53 Pet. conv. to/from prov.	527
____R182 Petition–(inv. name chg., order of inv., atty/assig. name chg., dup. let. pat.)	519	____R78(a)(3)/(6)Petition	535
____R182 Petition – (omit items w/postcard)	520	____R55(c) Petition	535
____R183(susp./waive ex. rule, R59)	503	____R55(a) Petition	507
____R378(b/e) Petition	532	____R183 Petition (corr.data 85b/pat)	538
____R378(c) Petition	533	____R314 Petition	508
____R377 Petition	521	____Pet. W/D Abn	525
____R381(b) Petition	523	____R705(b) PTA-Bef iss	550
____R181 Petition (rev. non-exam)	515	____R705(d) PTA-Aft iss	551
____R181 Petition (rev.exam)	504	____R705(c) Reinstate red. term.	552
		____R701 PTE	553
		____Other____________	

2. LIST PAPERS FILED WITH PETITIONS

____PreAmdt/Amdt	____CPA	____Associate POA
____Filing Fees	____RCE	____Terminal Disclaimer
____Reply/Arguments	____IDS	____Change of Address
____Election	____129(a) Submsn	____Revocation/POA
____Notice of Appeal	____Issue Fee	____Priority Documents
____Brief (3)	____Drawings	____Request C of C
____Reply Brief	____Oath/Decl & POA	____Rule 312 Amdt
____Declaration R132	____Ext Time (___)	____Statement 3.73b

Other Papers____

____

3. Is paper a petition to withdraw holding of abandonment: ____yes____no
If so, send paper and/or file to appropriate location *(Note: remove any flag set first)*:

a. Nonreceipt of action from TC or assertion that reply was timely filed:
Send paper to TC____________
b. Nonreceipt of Missing Parts Notice or assertion that reply was timely filed:
Send paper to -OIPE - -CP2-5B26- - ATTN: Doshie Day
c: Assertion of timely payment of issue fee and/or submission of drawings:
Send petition to Office of Publications: ATTN: Tom Hawkins
d. Other________________________________

4. Other:____
If not handled in Office of Petitions, send paper to appropriate location.

5. Is petition accompanied by assignment papers, fee address, or other paper which needs to be sent to another location? ____ yes ____ no If so, make copy of assignment papers, fee address, or other paper; mail original to proper location and place copy in file with an indication that the

EXHIBIT F

06859037 #36

OIPE IAP22 AUG 13 2007 PATENT & TRADEMARK OFFICE

ALTON B. HORNBACK
5650 Bloch Street
San Diego, CA 92122
(858) 453-3334
8 August 2007

Mail Stop PETITIONS
Commissioner for Patents
Post Office Box 1450
Alexandria, VA 22313-1450

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Attn: Brian Hearn

Subject: Addendum to Letter of 2 August 2007, Re: Reissue of Patent No. 6,079,666.

Sir:

This letter is an attempt to set the record straight regarding the errors in the patent claims.

In your letter of 25 July 2007 at 3, you stated (emphasis added):

> Second, the papers included with Enclosure 4 [Enclosure 3 in Subject Letter] do not appear to be part of the official record. For example, the UNCLASSIFIED stamp and the annotations D000322-D000326 in the lower right-hand corner do not appear in the Office's record.

That is not correct. Pages D000322-D000326 (here, Enclosure 3) were mailed to Petitioner on 3 November 2001 by Counsel for Defense in Case No. 99-38 C, U.S. Court of Federal Claims, in response to a discovery request to produce SUPPLEMENTAL Amendment A CLASSIFIED ANNEX. Those same pages (Attachment 1) appear in the PTO File Wrapper which was mailed to Petitioner by the PTO on 9 August 2000.

TABLE I

Encl. 3 Page No.		File Wraper Page No.
D000322	---------	D000122 D000088[1]
D000323	---------	D000089
D000324	---------	D000090
D000325	---------	D000091
D000326	---------	D000092 D000093

[1] Page No. D000088 is not Page 1 of SUPPLEMENTAL Amendment A CLASSIFIED ANNEX, but instead, is the "TRANSMITTAL OF DATA" cover sheet for Amendment A, itself, which was UNCLASSIFIED. Note that, at that time, Page 2 of that document (D000089) was classified at the level of CONFIDENTIAL. Accordingly, the inclusion of page D000089 in an UNCLASSIFIED package would be a breach of security.

Note that PTO File Wrapper page number D000093, which is supposed to be the last page of SUPPLEMENTAL Appendix A CLASSIFIED ANNEX containing Petitioners signature, is in fact, blank except for the PTO stamp, which on close examination, can be seen to be only a photocopy of the stamp on page 1 of that document (Enclosure 3 at D000322, PTO File Wrapper at D000122). What, in the name of common sense, could be the purpose of including in that File Wrapper, a page with nothing on it except the PTO STAMP?

Moreover, page 1 of SUPPLEMENTAL Amendment A CLASSIFIED ANNEX was shown to be the misplaced PTO File Wrapper page number D000122. And finally, the signature page of that document is missing.

Petitioner is well aware that, at this juncture, he is asking the PTO to believe the unbelievable. However, it must be kept in mind that, for 13 years, the patent application was not only under a Secrecy Order pursuant to 35 U.S.C. 181, but was also classified at the level of SECRET pursuant to national security Executive Order 12356 which mandates a "taking" as a prerequisite for that classification. Accordingly, the PTO takes its marching orders from DoD in all matters relating to a patent application which is under a Secrecy Order pursuant to that statute. Thus, the PTO -- itself, with no axe to grind -- was then only the conduit for discombobulating the File Wrapper, and bastardizing the patent with those acknowledged errors for which the PTO appologized in its Letter of 25 July 2007 at 3, so as to let the patent issue, while rendering it ununderstandable for counterintelligence purposes.

WHEREFORE, can there be any doubt that the errors in the either the patent specifications or patent claims were not the fault of Petitioner?

Respectfully submitted.

Alton B. Hornback

Alton B. Hornback, Petitioner

Attachments: 1 As noted.

ATTACHMENT 1

1M 274367

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

August 09, 2000

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS OF:

APPLICATION NUMBER: *06/859,033*
FILING DATE: *April 25, 1986*
PATENT NUMBER: *6,079,666*
ISSUE DATE: *June 27, 2000*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

W. Montgomery
W. MONTGOMERY
Certifying Officer

D000001

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Duplicate

In the United States Patent and Trademark Office

Serial Nr.: 06/859,033

Filed: 04/25/1986

Inventor(s): ALTON B. HORNBACK

Title: REAL TIME BORESIGHT ERROR SLOPE SENSOR (u)

Examiner and G.A.U.: CHARLES T. JORDAN/GAU 221

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SUPPLEMENTAL **Amendment** A
CLASSIFIED ANNEX

Date: 6 MAY 1987

Commissioner of Patents and Trademarks
Washington, District of Columbia 20231

Sir:

In response to the Office Letter mailed 02/20, 1987, please amend the above application as follows:

Alton B. Hornback
ALTON B. HORNBACK, APPLICANT

Original classification authority:
DOD 5200.1-R/AFR 205-1, "Information Security Program Regulation", and IAW DOD 5200.1-H/AFR 205-37.

Agency and office or origin:
Air Force Armament Laboratory/DLM (AD)
Eglin AFB FL 32542

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Licensing and Review DECLASSIFIED

Contract No. IRAD 1192	☐ Review For Declassification	☐ Declassify On	15 OCT 99
Classified by AFATL/DLM (AD) EGLIN AFB		☐ Downgrade To	On

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MCDONNELL DOUGLAS CORPORATION

TRANSMITTAL OF DATA

FROM: MCDONNELL DOUGLAS ASTRONAUTICS COMPANY

DATE 1 May 1987
NUMBER

TO: COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON, DISTRICT OF COLUMBIA 20231

ATTN.: CHARLES T. JORDAN / GAU 221

VIA:

SUBJECT: PATENT AMENDMENT A
REAL TIME BORESIGHT ERROR SLOPE SENSOR

QTY	DWG OR REPORT NUMBER	CHG LETTER OR DATE	COPY NO.	DESCRIPTION/TITLE OF DATA	CLASSI-FICATION
1				REAL TIME BORESIGHT ERROR SLOPE SENSOR RECEIVED GROUP 220 MAY 1 - 1987 LICENSING & REVIEW	C

REASON FOR TRANSMITTAL
AMENDMENT TO PATENT APPLICATION

BY Alton B. Hornback
SIGNATURE – DIRECTOR LEVEL OR HIGHER (OR DESIGNEE)

ALTON B. HORNBACK
SIGNER (TYPE OR PRINT)

SR ENGR/SCIENTIST
TITLE

0000591

30-512 (01 NOV 73)

D000088

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(U) Claims:

(U) Claim 1, cancel and rewrite as new claim 3 as follows:

(C) 3. A boresight error slope reduction system for sensing, in real time, a boresight error slope in a homing seeker, said system comprising:

(U) (a) a seeker having a steerable field-of-view, said field-of-view having an electrical boresight axis, and

(U) (b) a receiver wherein a video signal voltage is obtained when an object is within said field-of-view, said object being on a line-of-sight from said seeker thereby causing an included angle between said line-of-sight and said boresight axis, said video signal voltage being a function of said included angle, and

(U) (c) a tracking loop having a means for using said video signal voltage to generate a filtered dynammc lag voltage, said dynamic lag voltage being used to steer said field-of-view so that said object remains within said field-of-view, and

(U) (d) a dither waveform generator wherein a dither voltage is generated and

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(U) (e) a means for using said dither voltage to cause a dither of said boresight axis and

(U) (f) a means for causing said tracking loop to be open during said dither of said boresight axis and

(U) (g) a boresight error slope computer circuit for generating a transfer characteristic having a measurable curvature, said transfer characteristic being a voltage functionally related to said included angle, said angle resulting from said dither, and

(C) (h) a boresight error slope computer circuit for generating a correction voltage, said correction voltage being a function of said curvature of said transfer characteristic in a neighborhood of said line of sight, and

(U) (i) an additive means for using said correction voltage to reduce said boresight error slope.

(U) Claim 2, cancel and rewrite as new claim 4 as follows:

(U) 4. The boresight error slope reduction system of claim 3 wherein said tracking loop includes an automatic gain control amplifier and an automatic gain control computer, said automatic gain control computer comprising:

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(U) (a) a transfer characteristic sample-and-hold circuit for obtaining two samples of said transfer characteristic, a first sample being obtained at a first instant, said first instant being the instant of coincidence between said video signal voltage and said filtered dynamic lag voltage, and a second sample being obtained at a second instant, said second instant being at a different time from said first instant, and

(U) (b) a signal subtracter circuit for generating a direct current signal voltage by subtracting said first sample of said transfer characteristic from said second sample of said transfer characteristic and

(U) (c) a dither sample-and-hold circuit for obtaining two samples of said dither voltage, a first sample of said dither voltage being obtained at said first instant and a second sample of said dither voltage being obtained at said second instant, and

(U) (d) a dither subtracter circuit for generating a direct current reference voltage by subtracting said first sample of said dither voltage from said second sample of said dither voltage and

(U) (e) an automatic gain control subtracter circuit for generating an automatic gain control voltage by subtracting said direct current reference voltage from said direct current signal voltage and

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(U) (f) a means for applying said automatic gain control voltage to said automatic gain control amplifier.

(U) Please add two new claims as follows:

(U) 5. The boresight error slope reduction system of claim 3 wherein said seeker is a radio frequency seeker having a phase sensing monopulse antenna and said additive means is a phase shifter.

(U) 6. The boresight error slope reduction system of claim 3 wherein said seeker is an infra-red seeker and said additive means is an adder circuit for adding said correction voltage to said dynamic lag voltage.

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D000093

EXHIBIT G

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
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ALTON B. HORNBACK
5650 BLOCH ST.
SAN DIEGO, CA 92122

Paper No. 37

In re Patent No. 6,079,666	:	LETTER REGARDING
Issue Date: June 27, 2000	:	CERTIFICATE OF CORRECTION
Application No. 06/859,033	:	AND
Filed: April 25, 1986	:	INFORMATION TO CORRECT
Patentee: Alton B. Hornback	:	A PATENT

This letter is in response to correspondences received August 6, 2007 and August 13, 2007[1] by the U.S. Patent and Trademark Office (Office), which includes an argument that a new patent pursuant to 35 U.S.C. § 131 should be issued for the above-identified patent or a corrected patent pursuant 37 CFR 1.322(b) rather than the proffered Certificate of Correction. The response also acknowledges the proposed Certificate of Correction to the specification of the above-identified patent attached to the July 25, 2007 letter from the Office, includes a second Certificate of Correction to the claims of the above-identified patent, and includes a conditional request to file a reissue application.

Statutes and Regulations

35 U.S.C. 131 Examination of application.

The Director shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor.

35 U.S.C. 154 Contents and term of patent; provisional rights.

(a) ...
(4) SPECIFICATION AND DRAWING. —A copy of the specification and drawing shall be annexed to the patent and be a part of such patent.

35 U.S.C. 254 Certificate of correction of Patent and Trademark Office mistake.

Whenever a mistake in a patent, incurred through the fault of the Patent and Trademark Office, is clearly disclosed by the records of the Office, the Director may issue a certificate of correction stating the fact and nature of such mistake, under seal, without charge, to be recorded in the records of patents. A printed copy thereof shall be attached to each printed copy of the patent, and such certificate shall be considered as part of the original patent. Every such patent, together with such certificate, shall have the same effect

[1] The letters are dated August 2 and 8, 2007, respectively.

and operation in law on the trial of actions for causes thereafter arising as if the same had been originally issued in such corrected form. The Director may issue a corrected patent without charge in lieu of and with like effect as a certificate of correction.

37 CFR 1.322 Certificate of correction of Office mistake.

(a)(1)The Director may issue a certificate of correction pursuant to 35 U.S.C. 254 to correct a mistake in a patent, incurred through the fault of the Office, which mistake is clearly disclosed in the records of the Office:

(i) At the request of the patentee or the patentee's assignee;

. . .

(4) The Office will not issue a certificate of correction under this section without first notifying the patentee (including any assignee of record) at the correspondence address of record as specified in § 1.33(a) and affording the patentee or an assignee an opportunity to be heard.

(b) If the nature of the mistake on the part of the Office is such that a certificate of correction is deemed inappropriate in form, the Director may issue a corrected patent in lieu thereof as a more appropriate form for certificate of correction, without expense to the patentee.

Issuance a Certificate of Correction to the Specification

As 35 U.S.C. § 254 and 37 CFR 1.322 set forth, the Director may issue a certificate of correction whenever a mistake in a patent, incurred through the fault of the Office, is clearly disclosed by the records of the Office. The patent, together with such certificate of correction (COC), shall have the same effect and operation in law as if the same had been originally issued in such corrected form. If the nature of the mistake on the part of the Office is such that a COC is deemed inappropriate in form, the Director may issue a corrected patent.

Upon review of the record and as stated previously, a certificate of correction, not a new or corrected patent, should be issued. First, while the Director has the discretion to issue a corrected patent in lieu of a COC, the nature of the mistakes on the part of the Office with respect to the above-identified patent are such that a COC is deemed more appropriate. Second, the mistakes requested to be corrected found in referenced Attachment 1 of the August 6, 2007 response are clerical or typographical in nature and are precisely the type of errors intended for a COC under 37 CFR 1.322(b). Third, the errors found in Attachment 1 are not gross or so numerous that a COC is deemed inappropriate in form. Finally, a COC can be printed in a shorter amount of time than a corrected patent.

The Office can dictate how patents will be formatted and was under no obligation to print the specification of U.S. Patent No. 6,079,666 in the format presented by the applicant. Specifically, neither the patent statute nor the rules of practice impose a duty upon the Office to print a patent in the format desired by the applicant. On the other hand, as explained in MPEP 1480, the Office has within its discretion the ability to issue a COC when it deems such appropriate. See 35 U.S.C. § 254. In the present case, the instant COC corrects mistakes in the original patent that may affect its meaning or are not necessarily obvious from the context of the patent.

Pursuant to 35 U.S.C. § 254 and 37 CFR 1.322(a)(4), the patentee of the above-identified patent has been afforded an opportunity to be heard on the proposed COC mailed with the July 25, 2007 letter. In response, the proposed COC was edited with regards to column 6, line 30 and column 6, lines 57 and 60. See Attachment 1 in the response of August 6, 2007. The dot above "θ" and "β" in column 6, line 30 has been emphasized in the attached COC. The Office also acknowledges the typographical error made in column 6, lines 57 and 60 of the proposed COC and has amended lines 57 and 60 to read – Ratio --.

In accordance with 35 U.S.C. § 254 and 37 CFR 1.322, the Office will issue the attached COC for U.S. Letters Patent No. 6,079,666 in due course. A memorandum will be forwarded to the Certificate of Corrections Branch.

Once again, the Office regrets the error and inconvenience.

Proposed Certificate of Correction to the Claims

The Office also acknowledges receipt of the proposed COC to the claims referred to as Attachment 2 in the August 6, 2007 response. As stated in letter mailed on July 25, 2007 and in MPEP 1480-1481 enclosed with the letter, such a request for a COC should have been addressed to:

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

The proposed COC labeled as Attachment 2 in the August 6, 2007 response and the August 13, 2007 addendum will be forwarded to the Certificate of Correction Branch for consideration of the corrections to the claims. Since Petitioner alleges the mistakes in the claims of the patent were the fault of the Office, the proposed COC labeled as Attachment 2 in the August 6, 2007 response should be considered under the provisions of 35 U.S.C. § 254 and 37 CFR 1.322.

Conditional Request to File a Reissue Application

The Office will not accept a conditional request for a reissue application. The filing of reissue application must comply with certain requirements as set forth in 35 U.S.C. § 251 and 37 CFR 1.171 through 1.178. Because the request on page 2 of the August 6, 2007 letter does not meet the requirements for a reissue application, it will not be treated as a reissue application. For this reason, the $395 check submitted with the response on August 6, 2007 is being returned with this letter.[2]

Additionally, Petitioner states, "if the PTO can show that any error in either the patent specifications or patent claims is the fault of Petitioner, then it should do so, and reissue the corrected patent pursuant to 35 U.S.C. 251[.]"[3] However, under 35 U.S.C. § 251, the Director shall reissue a patent when any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent. The statute places the burden on the applicant to demonstrate to the Office that U.S. Patent No. 6,079,666 is wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent. Please further note applicant must include any changes, additions or deletions that were made by a Certificate of Correction to the original patent grant, in the reissue application. See MPEP 1411.01. This means, if petitioner decides to submit a proper reissue application, the changes made by the above-discussed Certificate of Correction to be issued must be included in any reissue application.

---

[2] A copy of the submitted check remains in the record with the routing and account number removed, for the patentee's protection.
[3] Page 2 of the August 6, 2007 response.

Enclosed is a copy of Chapter 1400 of the MPEP for your consideration. Sections 1401 through 1470 addresses the procedures and handling of reissue applications.

Employ Services of Attorney or Agent

An examination of this file reveals that patentee is unfamiliar with patent prosecution procedure. Lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Patentee is advised to secure the services of a registered patent attorney or agent to handle the above matters, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

A listing of registered patent attorneys and agents is available on the USPTO Internet web site http://www.uspto.gov in the Site Index under "Agents and Attorney Roster, Patent." Applicants may also obtain a list of registered patent attorneys and agents located in their area by writing to the Mail Stop OED, Director of the U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450.

As the filing of a reissue application is even more complicated and complex than the prosecution of a non-provisional application, the Office reiterates its recommendation to employ the services of a practitioner.

Telephone inquiries concerning this letter should be directed to Denise Pothier at (571) 272-4787.

Brian Hearn
Petitions Examiner
Office of Petitions

enc: completed Certificate of Correction for U.S. Patent No. 6,079,666 to be issued
Chapter 1400 of the MPEP
$395 check signed by patentee

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,079,666
APPLICATION NO.: 06/859,033
DATED : June 27, 2000
INVENTOR(S) : Alton B. Hornback

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the specification, column 2, line 2, "statistic" should read -- statistics --;

Column 3, line 7, "(e)" should read -- (d) --;

Column 3, line 9, "(f)" should read -- (e) --;

Column 4, line 12, cancel the text, "Re";

Column 4, line 14, "$\left[\frac{\Delta}{\Sigma}\right]$." should read -- Re$\left[\frac{\Delta}{\Sigma}\right]$. --;

Column 4, line 30, cancel the text, "Re";

Column 4, line 32, "$\left[\frac{\Delta}{\Sigma}\right]$" should read -- Re$\left[\frac{\Delta}{\Sigma}\right]$ --;

Column 4, line 55, "6(LOS)" should read -- δ(LOS) --;

Column 5, lines 12, 49, and 63, for each occurrence, "$\delta(LOS\gamma\Delta\theta)$" should read -- $\delta(LOS\pm\Delta\theta)$ --;

Column 5, line 22, after "V_m", insert -- = -- and "$V_{DR}(LOS\Delta\theta)$" should read -- $V_{DR}(LOS\text{-}\Delta\theta)$ --;

Column 5, line 64, "$V_D(LOS\gamma\Delta\theta)$" should read -- $V_D(LOS\pm\Delta\theta)$ --;

Column 5, line 68, after "V_{AGC}" insert -- = -- and "$V_{DR}(LOS+\Delta\theta)$" should read -- $V_{DR}(LOS\pm\Delta\theta)$ --;

Column 6, line 30, "$\dot{\theta}$" should read -- $\dot{\beta}$ --;

Column 6, line 40, "T" should read -- τ --; and

Column 6, line 54, cancel the text, "RE";

Column 6, line 57, "$\left[\frac{\Delta}{\Sigma}\right]$" should read -- Re$\left[\frac{\Delta}{\Sigma}\right]$ Ratio detector output --; and

Column 6, line 60, cancel the text, "Ratio detector output".

ATTACHMENT 2

PTO/SB/44 (06-07)
Approved for use through 06/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 6,079,666
APPLICATION NO.: 08/859,033
ISSUE DATE : JUNE 27, 2000
INVENTOR(S) : ALTON B. HORNBACK

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

ERRORS IN PATENT CLAIMS

Column 7

Line 11.	Delete "wide bandwidth".
Line 14.	After "seeker" add -- thereby --.
Line 17.	After "said" add -- video --.
Line 18.	After "to" add -- generate a filtered dynamic lag voltage, said dynamic lag voltage being used --.
Line 19.	After "field-of-view" add -- , --.
Line 19-20.	Delete "a means for generating a low-pass filtered dynamic lag voltage from said video signal voltage, and".

Column 8

Line 7.	Delete "wide bandwidth".
Line 7.	Delete "low-pass".

MAILING ADDRESS OF SENDER (Please do not use customer number below):

ALTON B. HORNBACK
5650 BLOCH STREET
SAN DIEGO, CA 92122

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.